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of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

May 30, 1978

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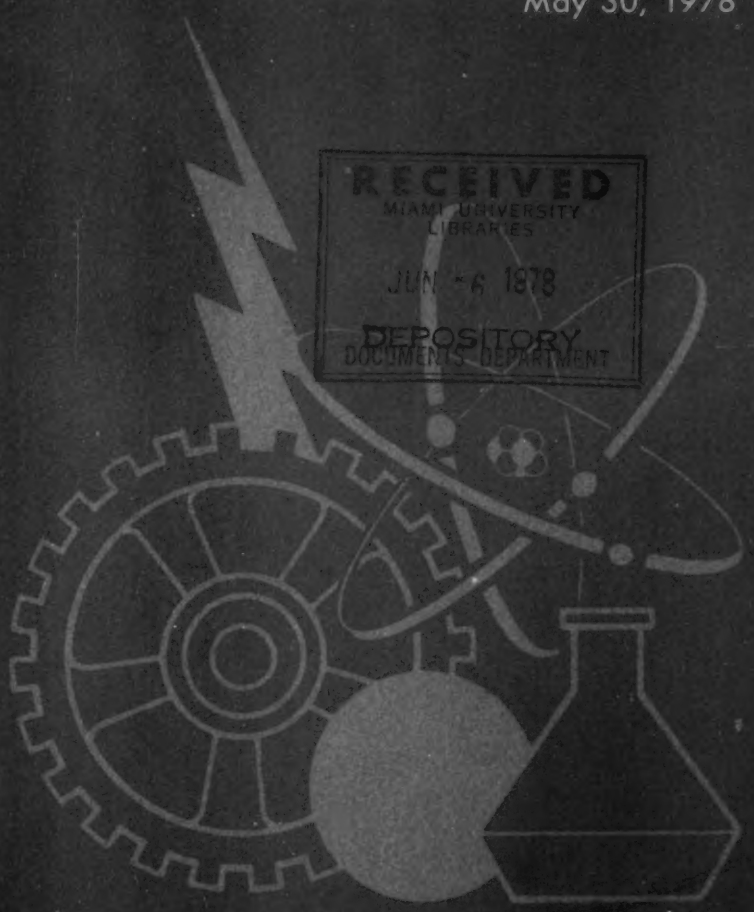

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

May 30, 1978 Volume 970 Number 5

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PATENT AND TRADEMARK OFFICE NOTICES

TITLE 37—PATENTS, TRADEMARKS, AND COPYRIGHTS

Chapter I—Patent and Trademark Office, Department of Commerce

PART 1—RULES OF PRACTICE IN PATENT CASES

Rule Promulgation Relating to Implementation of the Patent Cooperation Treaty

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Final Rule.

SUMMARY: This notice adopts rule changes which permit the filing of United States national patent applications in the format required by the Patent Cooperation Treaty which entered into force on January 24, 1978. Some of these rule changes are necessary in order that international applications arriving for national examination in the United States Patent and Trademark Office as a Designated Office are formally acceptable. The changes also permit applicants for United States patents to file their United States national applications in the same format as that required by the Patent Cooperation Treaty, which is also the format required by the European Patent Convention. Other changes are made in the rules which relate to the filing of international and national applications.

DATES: Effective date, June 1, 1978. The amended rules apply to national and international applications filed on and after the effective date. It should be noted that international applications may be filed on and after June 1, 1978.

FOR FURTHER INFORMATION CONTACT: Mr. Louis O. Maassel by telephone at (703) 557-3070, or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

SUPPLEMENTARY INFORMATION: This notice promulgates a number of previously proposed rule changes relating to the filing of international applications under the Patent Cooperation Treaty and the filing of United States national applications which have the same format as international applications. Notice was given on January 12, 1977 in the Federal Register (42 FR 2632–2644) and on February 8, 1977 in the Official Gazette (955 O.G. 350–363) of a proposal to amend Title 37 of the Code of Federal Regulations upon the entry into force of the Patent Cooperation Treaty and Public Law 94–131 (94th Congress; 89 Stat. 685). Interested persons were invited to comment on the proposal on or before May 26, 1977, on which date a public hearing was held. The time for submitting written comments was extended until August 31, 1977 by a notice published on June 23, 1977 in the Federal Register (42 FR 31812) and on July 12, 1977 in the Official Gazette (960 O.G. 8). Twenty-four comments relevant to the proposed rule changes were received. The comments relating to the rules established in this notice are discussed in the commentary of the rules. A transcript of all comments presented by two persons at the oral hearing, and the written statements received are available for public inspection in Room 11E10 of Crystal Plaza Building 3, 2021 Jefferson Davis Highway, Arlington, Virginia. Some of the rules of the above-mentioned proposals, namely, sections 1.75, 1.81 and 1.83, have already been promulgated by the rule change which appeared in the Federal Register of January 31, 1978 at 43 FR 4014–4015 and on February 21, 1978 in the Official Gazette at 967 O.G. 12. This promulgation permits the filing of United States national applications in the same format as international applications and also makes a number of other changes in the rules.

Comments on Adopted Rules

No comments were received relating to sections 1.1, 1.4, 1.5, 1.8, 1.9, and 1.12. These sections are promulgated as proposed.

Section 1.14 received three comments. One letter suggested adding another paragraph (e) to mention that defense agencies are given access to applications relating to national security. Another letter indicated no objection to such an addition but did not consider it necessary. The first mentioned comment was not adopted since the proposed paragraph (e) would be restating a provision appearing in section 5.1(b). The third letter questioned whether the Patent and Trademark Office would supply a copy of the international application "pamphlet" after it was published. In response to this comment it should be noted that the Office will supply copies of the "pamphlet" at the regular price of 30 per page but that it will not give access to or supply copies of any pending national or international application without the written authorization of the applicant, assignee or attorney or agent of record. Paragraph (c) has been revised to refer to the Department of Energy which now has the pertinent responsibilities under the Atomic Energy Act.

Section 1.21 received one comment indicating that it was not clear whether the fee was required for both the international-type search and search report or only for the search report. The rule has been amended in order to clarify that the fee is required for the report only.

Sections 1.23 and 1.25 received no comments and are adopted as proposed.

Section 1.26 has been revised from the proposal by providing for only three choices as to refund rather than five. This change was made to simplify the determination of the amount of the refund, if any. In addition, the rounding of refunds was changed from the next higher multiple of $10 to the next higher multiple of $5 for greater preciseness.

Section 1.52 received one comment which proposed changing the wording of 1.52(c) to permit applicant's representative, as well as the applicant himself, to initial changes to application papers made before filing. Since no change in section 1.52(c) had been proposed, the suggested change is not required by the Patent Cooperation Treaty, the proposal is not being adopted in this promulgation.

Two comments were received noting that the proposed wording in section 1.55 did not distinguish between the prior art effective dates of international applications filed in the United States and those filed outside the United States. The proposed wording is correct since it corresponds with the language of 35 U.S.C. 102(e) as amended by Public Law 94–131.

Section 1.57 received two comments to the effect that applicants of international applications were given greater rights than national applicants since the proposed rule states that it is not required that the applicant of an international application have the oath or declaration attached to the specification at the time of signing. In response, it is acknowledged that the practice set forth in proposed section 1.57 is somewhat different for the two filing routes; however, the proposed wording follows the concepts set forth in 35 U.S.C. 371(c) as added by Public Law 94–131. Accordingly, no change is considered to be necessary or desirable.

One comment was received relating to section 1.58. The comment indicated the rule should relate only to complex chemical and mathematical formulas and tables. This comment has been adopted by revising section 1.58(c) to add the word "complex" before "formulas."

Section 1.61 received two comments from one person. The first comment relating to a question of where an international application would be examined for issuance, is not understood since international applications are not issued. However, since the comment did raise the matter of examination, a phrase has been added to indicate clearly that the requirements of section 1.61 must be followed if an examination for a U.S. patent is desired in an international application. The second comment indicated that there was no antecedent basis for the "mailing date of the declaration to the applicant." The declaration is clearly mentioned at the beginning of paragraph 1.61(b). The meaning of the mailing date of such a document to the applicant appears to be sufficently clear. No change is considered to be necessary in response to the second comment. In addition, numbers have been added to each of the listed items to improve readability.

Section 1.70 received two comments. Both related to providing uniformity between sections 1.65 and 1.70. It should be noted that section 1.65 was amended shortly after the time the proposal was published. Proposed section 1.70 has accordingly been amended to include the newly added wording of section 1.65. The wording of proposed section 1.70 has also been amended to provide for both genders.

Section 1.72 received no comments and is adopted as proposed.

One comment was submitted concerning section 1.77 which suggested that the rule specify that an attorney's docket number and the name of the inventor may be placed on the initial page of an application. Such a procedure is currently permitted, although not specifically mentioned in the rules. Since such data is not considered to be one of the application elements, the amendment of section 1.77 is not considered to be necessary. The rule is adopted as proposed.

No comments were received concerning section 1.78. This rule is adopted as proposed.

Section 1.84 relating to standards for drawings received four comments. One suggestion, not adopted, was that drawings on 8½ by 11 inch paper be permitted. Although this size is close to DIN size A4, the additional processing and printing problems which would result from three different paper sizes appear to be greater than the resulting benefits at this time. Some experience with the two sizes proposed is felt to be desirable before any additional alternatives are permitted. One comment proposed that this rule be adopted as early as possible. Since drawings under existing rules can also be prepared in a way which will later permit easy compliance with PCT requirements, it was considered unnecessary to adopt this suggestion. Two comments were received concerning the interpretation of paragraph (l). Although the wording of this paragraph is in substance the wording of PCT Rule 11.13(l), second sentence, it appears that some clarification is necessary. Therefore proposed paragraph (l) has been amended to clarify the intended requirements. The reference to blue ink in subparagraph (c) has been deleted since it has been deleted from the Treaty regulations.

Section 1.104 received one comment, which also related to section 1.21, to the effect that the proposed wording was not clear. The proposed section has been slightly revised and a note added for purpose of clarity. The preparation of a formal international-type search report is not required by the U.S. Patent and Trademark Office in order for the international-type search to serve as the basis for a search fee refund in a later international application.

Section 1.141 was commented upon by seven persons. The comments of several persons indicated that it appeared that paragraph 1.141(e) was unnecessary. This view is accepted; accordingly, paragraph 1.141(e) has been deleted from the promulgation. Another comment indicated that no need was seen to limit the wording of subparagraph (c) to only a few categories of claims. The treaty requires that the arrangements of claims described in (c), (i) and (ii) be considered as one invention, subject to the conditions stated in PCT Rule 13.2. It should be noted that proposed subparagraphs (c), (i) and (ii) are substantially a copy of PCT Rule 13.2. However, in view of this and other comments and for clarity, sections 1.141 and 1.146 and 1.481 and 1.482 have been substantially rewritten, amplified, and reorganized to clarify the meaning of certain terms, namely, "specially adapted" and "specifically designed", to conform more closely to current Office practice as set forth in MPEP sections 806.05(e)–(g). Both proposed rules 1.141 and 1.146 have been modified to clarify that the rules make little change in current restriction practice. The differences between the PCT unity of invention requirement and current restriction practice are minimal. The rewriting and reorganization of proposed sections 1.141 and 1.146 substantially states the current rule language except that the five species limitation is removed. Other comments indicated additional clarification of the other paragraphs would also be helpful. Such amendments have been made as mentioned.

Four comments were submitted relating to section 1.146. One comment received indicated that no reason was found in the PCT as to why an election of species is required regardless of whether or not there is an allowable generic claim. Although there is no reason in the PCT for such a requirement, the rule was amended to reflect current Office practice which in MPEP section 808.01(a) allows the examiner to require an election of species prior to the search. The second comment indicated a preference to maintain current restriction practice in all national applications which were not filed under the PCT route. This comment has been satisfied by the rewriting of the rules mentioned above. The third and fourth comments indicated that no need was seen to seek a requirement for restriction in all cases. These comments are similarly satisfied by the rewriting of the rules.

No comments were received concerning sections 1.318 and 1.331. These rules have been adopted as proposed.

Section 1.401 received no comments; however, "or" has been changed to—and—in subparagraph (a).

Section 1.412 was commented on by two persons. One comment suggested that a subparagraph (5) be added to refer to the licensing requirements of Part 5. This proposal has been adopted. The other comment considered the addition unnecessary.

Section 1.413 received no comments. However, the wording has been revised to provide for the United States Patent and Trademark Office to act as an International Searching Authority for other Receiving Offices subject to the approval of an agreement as such by the Commissioner. The name of the International Searching Authority has also been changed to follow the Administrative Instructions.

One comment was received relative to section 1.414 questioning the use of the word "will" in subparagraph (a). After review, no problem is seen with the proposed wording; therefore, no change is considered to be necessary.

Section 1.415 received no comments and is adopted as proposed.

Section 1.421 received comments from two persons. One comment is related to the requirement that the inventor must file the international application if patent protection is desired in the United States as a Designated State. This provision is set forth in 35 U.S.C. 373 and cannot be changed by modification of the rules. However, the rules, as proposed, have been amended and subparagraph (d) added to permit the attorney or agent to sign on behalf of the inventor. The other comment relates to the requirement that only nationals and residents of the United States can file in the United States Receiving Office. The requirement appears in 35 U.S.C. 361(a). As to the situation involving an invention made in this country by an inventor who is neither a resident nor national, such an inventor may file a regular U.S. national application or may obtain a license under 35 U.S.C. 184 to file in the foreign Receiving Office for the country of which the inventor is a resident or national.

No comments were received concerning sections 1.422, 1.423, 1.424 and 1.425. Except for the addition of one reference to the feminine gender, these rules are adopted as proposed.

Sections 1.431 and 1.432 were both the subject of a question as to whether the withdrawal of the international application would result in withdrawal of the national application. The withdrawal of the international application would result in the withdrawal of the designation of all States. If the United States was designated in an international application which was withdrawn before the requirements of 35 U.S.C. 371 were fulfilled, no processing of that withdrawn application would occur except as provided under PCT Article 25. These sections are adopted as proposed.

Section 1.433 received two comments, both related to the fact that the broad reference to PCT Rule 11 did not clearly indicate what size papers were required. This matter has been clarified in the promulgated rule to indicate that DIN A4 size sheets are required.

One comment was received concerning section 1.434 which correctly noted that the second arrow used to indicate additions in the proposal, should have been at the end of the paragraph.

No comments were received concerning sections 1.435, 1.437 and 1.438. These sections are adopted as proposed.

Section 1.436 has been amended to specifically include the requirement of PCT Rule 6.1(a), that the number of claims shall be reasonable.

Two comments were received relating to section 1.445 which indicated that the proposed fee amounts were too high. After review, it is felt that the fee amounts are set as required to cover 100% of the costs involved.

No comments were received concerning section 1.446; however, the number of refund choices has been reduced from 5 to 3 to simplify the determination choices.

No comments were received concerning section 1.451. Subparagraph (c) was amended to clarify the intent of the rule.

Section 1.455 received one comment which indicated that the expression "common representative" was not understood. This comment has been answered by adding a citation to PCT Rule 4.8, which explains the expression.

Section 1.461 received comments from four persons which proposed that a new subparagraph (c) be added which warns that a foreign filing license may be required to transmit a

copy of the international application outside the United States. This suggestion has been adopted.

One comment relative to section 1.465 noted that the notation "PCT" was inadvertently omitted before a rule citation. This, along with a rule citation, have been corrected in the promulgation.

Section 1.468 received two comments, both related to problems raised by subparagraph (b). Upon reconsideration it appears that the broad language of subparagraph (a) and the reference to PCT Rule 82 is sufficient; accordingly, proposed subparagraph (b) has been deleted.

Section 1.471 received one comment which related to amendments at the national stage. Since this rule relates only to international stage amendments, the rule is promulgated as proposed.

No comments were received relating to section 1.475; accordingly, the rule is promulgated as proposed.

Section 1.481 received one general comment which related to national practice rather than the international practice covered by this rule. However, changes were made in the proposed rules 1.481 and 1.482 to clarify them and make them more understandable. For one, it now makes clear that PCT Rule 13 is consistent with much of current practice under sections 1.141 and 1.146 with several exceptions specifically set out in section 1.481. The protest provisions have also been moved from section 1.481 to section 1.482 since the handling of protests is somewhat different subject matter than the other contents of section 1.481. In addition, subsection (c) of proposed section 1.482 was moved to section 1.481 where the subject matter is more pertinent. The other subsections of proposed subsection 1.482 were eliminated as unnecessary since they are part of existing practice and do not require inclusion in the rules specifically. The reference in section 1.481 to PCT Rule 13 in effect, includes these deleted subsections by reference.

A number of references to sections of the Administrative Instructions have been changed to reflect changes in the numbering of sections in the current version of the Administrative Instructions.

PART 3

Sections 3.56 and 3.57 received two comments. One comment essentially involved deleting the basic requirements of section 1.70. This proposal has not been adopted since it also affects section 1.65 and must be given careful study and an opportunity for comment allowed before any such change may be made. The other proposal indicated that the "duty of disclosure" provisions were not in these forms. The forms have been revised to include this duty.

PART 5

Section 5.1 received comments from two persons. Subparagraph (a) has been substantially rewritten to provide for filing of international applications in the United States Receiving Office without a license for foreign filing but for limiting the transmittal of the international application to a foreign national or international agency. Subparagraph (b) has been revised to refer to the Department of Energy.

Section 5.3 received comments from two persons which related to subparagraph (d). This subparagraph has been rewritten in view of the comments received.

Section 5.11 received comments from ten persons who all suggested that the rule be rewritten to permit the initial filing of an international application in the United States Receiving Office without a license. The rule has been rewritten in this manner.

Section 5.13 is amended due to a submitted proposal although the rule was not included in the proposed rule change notice. The changes made in section 5.13 follow the concepts suggested by numerous comments to section 5.11. Therefore, it is felt that the change can be made even though such a change was not proposed.

Section 5.14 received one comment as to possible processing problems but no suggestion was made; accordingly, the section is adopted as proposed.

Section 5.15 has been revised as suggested by two persons to refer to transmittal of the international application rather than filing thereof.

No comments were received relative to Section 5.17; this rule is adopted as proposed.

In a number of instances, references to the masculine gender have been deleted.

The Patent and Trademark Office has determined that this document does not contain a major proposal requiring preparation of an Economic Impact Statement Under Executive Orders 11821 and 11949 and OMB Circular A-107.

The following table of contents indicates the contents of the promulgated subparts and the location of added sections and section headings.

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(§§ 1.1–1.26)

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* * *

§ 1.9 Definitions.

* * * * *

SUBPART B—NATIONAL PROCESSING PROVISIONS

(§§ 1.31–1.352)

* * * * *

The Application

* * *

§ 1.61 Filing of applications in the United States of America as a Designated Office.

Oath or Declaration

* * *

§ 1.70 Content of oath or declaration relating to content of and amendments to an application under 35 U.S.C. 371(c)(4).

* * * * *

Allowance and Issue of Patent

* * *

§ 1.318 *Notification of national publication of a patent based on an international application*

* * * * *

SUBPART C—INTERNATIONAL PROCESSING PROVISIONS

(§§ 1.401–1.482)

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Unity of Invention

§ 1.481 Determination of unity of invention before the International Searching Authority.
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PART 3—FORMS FOR PATENT CASES

* * *

§ 3.56 Oath to be filed with United States Designated Office under 35 U.S.C. 371(c)(4).
§ 3.57 Declaration to be filed with United States Designated Office under 35 U.S.C. 371(c)(4).

Accordingly, 37 CFR parts 1, 3 and 5 are amended as follows:

1. By revising § 1.1 to read as follows:

§ 1.1 *All communications to be addressed to Commissioner of Patents and Trademarks.*

All letters and other communications intended for the Patent and Trademark Office must be addressed to "Commissioner of Patents and Trademarks," Washington, D.C. 20231. When appropriate, a letter should also be marked for the attention of a particular officer or individual. Letters and other communications relating to international applications during the international stage and prior to the assignment of a national serial number should be additionally marked "Box PCT."

NOTE: §§ 1.1 to 1.26 are applicable to trademark cases as well as to national and international patent cases except for provisions specifically directed to patent cases. See § 1.9 for definitions of "national application" and "international application."

2. By revising paragraph (a) of § 1.4 to read as follows:

§ 1.4 *Nature of correspondence.*

(a) Correspondence with the Patent and Trademark Office comprises (1) correspondence relating to services and facilities of the Office, such as general inquiries, requests for publications supplied by the Office, orders for printed copies of patents or trademark registrations, orders for copies of records, transmission of assignments for recording, and the like, and (2) correspondence in and relating to a particular application or other proceeding in the Office. See particularly the rules relating to the filing, processing, or other proceedings of national applications in Subpart B, §§ 1.31 to 1.352; of international applications in Subpart C, §§ 1.401 to 1.482; and of Trademark applications §§ 2.11 to 2.189.

* * * * *

3. By revising paragraph (a) of § 1.5 to read as follows:

§ 1.5 *Indentification of application, patent or registration.*

(a) When a letter concerns an application for patent, it should state the name of the applicant, the title of the invention, the serial number or international application number of the application, the date of filing the same, and, if known, the group art unit and name of the examiner to which it has been assigned (see § 1.55).

* * * * *

4. By revising paragraph (a)(1) and adding paragraph (xi) of § 1.8 to read as follows:

§ 1.8 *Certificate of mailing.*

(a) Except in the cases enumerated below, papers and fees required to be filed in the Patent and Trademark Office within a set period of time will be considered as being timely filed if (1) they are addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, and deposited with the United States Postal Service with sufficient postage as first class mail prior to expiration of the set period, and (2) they are accompanied by a certificate stating the date of deposit (see forms, §§ 3.55 and 4.23). The person signing the certificate should have reasonable basis to expect that the correspondence would be mailed on or before the date indicated. The actual date of receipt of the paper or fee will be used for all other purposes. This procedure does not apply to the following:

(1) The filing of national applications for patent;

* * * * *

(xi) The filing of international applications for patent and papers relating thereto.

* * * * *

5. A new section 1.9 is added to read as follows:

§ 1.9 *Definitions.*

(a) A national application as used in this Chapter means a United States national application for patent which was either filed in the Office under 35 U.S.C. 111 or which resulted from an international application after compliance with 35 U.S.C. 371.

(b) An international application as used in this Chapter means an international application for patent filed under the Patent Cooperation Treaty prior to entering national processing at the Designated Office stage.

6. By revising § 1.12 to read as follows:

§ 1.12 *Assignment records open to public inspection.*

The assignment records, relating to original or reissue patents, including digests and indexes, are open to public inspection and copies of any instrument recorded may be obtained upon payment of the fee therefor. Assignment records, digests and indexes, relating to any pending or abandoned application are not available to the public. Copies of any such assignment records and information with respect thereto shall be obtainable only upon written authority of the applicant or his assignee or attorney or agent or upon a showing that the person seeking such information is a bona fide prospective or actual purchaser, mortgagee or licensee of such application, unless it shall be necessary to the proper conduct of business before the Office or as provided by these rules. An order for a copy of an assignment should give the identification of the record. If identified only by the name of the patentee and number of the patent, or in the case of a trademark registration by the name of the registrant and number of the registration, or by name of the applicant and serial number or international application number of the application, an extra charge will be made for the time consumed in making a search for such assignment.

7. By revising paragraphs (a) and (c) of § 1.14 to read as follows:

§ 1.14 *Patent applications preserved in secrecy.*

(a) Except as provided in § 1.11(b) pending patent applications are preserved in secrecy. No information will be given by the Office respecting the filing by any particular person of an application for a patent, the pendency of any particular case before it, or the subject matter of any particular application, nor will access be given to or copies furnished of any pending application or papers relating thereto, without written authority in that particular application from the applicant or his assignee or attorney or agent of record, unless the application has been identified by serial number in a published patent document or the United States of America has been indicated as a Designated State in a published international application, in which case status information such as whether it is pending, abandoned or patented may be supplied, or unless it shall be necessary to the proper conduct of business before the Office or as provided by this part. Where

an application has been patented, the patent number and issue date may also be supplied.

* * * * *

(c) Applications for patents which disclose, or which appear to disclose, or which purport to disclose, inventions or discoveries relating to atomic energy are reported to the Department of Energy, which Department will be given access to such applications, but such reporting does not constitute a determination that the subject matter of each application so reported is in fact useful or an invention or discovery or that such application in fact discloses subject matter in categories specified by sections 151(c) and 151(d) of the Atomic Energy Act of 1954, 68 Stat. 919; 42 U.S.C. 2181 (c) and (d).

* * * * *

8. By adding a new paragraph (w) to § 1.21 to read as follows:

§ 1.21 *Patent and miscellaneous fees and charges.*

* * * * *

(w) For preparing an international-type search report of an international-type search made at the time of the first action on the merits in a national patent application.... $25.00

NOTE: The Patent and Trademark Office does not require that a formal report be prepared of an international-type search in order to obtain a search fee refund in a later filed international application. For fees relating to processing of international applications, see § 1.445.

9. By revising § 1.23 to read as follows:

§ 1.23 *Method of payment.*

All payments of money required for Patent and Trademark Office fees, including fees for the processing of international applications (§ 1.445), should be made in United States specie, Treasury notes, national bank notes, post office money orders, or by certified check. If sent in any other form, the Office may delay or cancel the credit until collection is made. Money orders and checks must be made payable to the Commissioner of Patents and Trademarks. Remittances from foreign countries must be payable and immediately negotiable in the United States for the full amount of the fee required. Money sent by mail to the Patent and Trademark Office will be at the risk of the sender; letters containing money should be registered.

10. By revising paragraph (b) of § 1.25 to read as follows:

§ 1.25 *Deposit accounts.*

* * * * *

(b) Filing, issue, appeal, international-type search report, international application processing, and petition fees may be charged against these accounts.

11. By revising § 1.26 to read as follows:

§ 1.26 *Refunds.*

Money paid by actual mistake or in excess, such as a payment not required by law, will be refunded, but a mere change of purpose after the payment of money, as when a party desires to withdraw his application or to withdraw an appeal, will not entitle a party to demand such a return. Refund of a portion of any international search fee paid to the Patent and Trademark Office may be made where the prior art search made during the subsequent examination of a national application is wholly or partly based on the earlier international search made in the international application for which the search fee was paid. The amount of the refund will be as determined by the examiner according to the value of the prior international search made by the Patent and Trademark Office as an International Searching Authority, as 90%, 45% or 0% of the international search fee. If the amount of the refund is not a multiple of $5, it will be rounded to the next higher multiple of $5. (Note § 1.446 for refund of the search fee in an international application.) Amounts of ten cents or less will not be returned unless specifically demanded, within a reasonable time, nor will the payer be notified of such amount; amounts over ten cents but less than one dollar may be returned in postage stamps, and other amounts by check.

12. By revising paragraphs (a) and (b) of § 1.52 to read as follows:

§ 1.52 *Language, paper, writing, margins.*

(a) The application, any amendments or corrections thereto, and the oath or declaration must be in the English language except as provided for in § 1.69, or be accompanied by a verified translation of the application and a translation of any corrections or amendments into the English language. All papers which are to become a part of the permanent records of the Patent and Trademark Office must be legibly written, typed, or printed in permanent ink or its equivalent in quality. All of the application papers must be presented in a form having sufficient clarity and contrast between the paper and the writing, typing, or printing thereon to permit the direct production of readily legible copies in any number by use of photographic, electrostatic, photooffset, and microfilming processes. If the papers are not of the required quality, substitute typewritten or printed papers of suitable quality may be required.

(b) The application papers (specification, including claims, abstract, oath or declaration, and papers as provided for in §§ 1.42, 1.43, 1.47, etc.) and also papers subsequently filed, must be plainly written on but one side of the paper. The size of all sheets of paper should be 8 to 8½ by 10½ to 13 inches (20.3 to 21.6 cm. by 26.6 to 33.0 cm.). A margin of at least approximately one inch (2.5 cm.) must be reserved on the left-hand side of each page. The top of each page of the application, including claims must have a margin of at least approximately ¾ inch (2 cm.). The lines of text must not be crowded too closely together; type-written lines should be 1½ or double spaced. The pages of the application, including claims and abstract, should be numbered consecutively, starting with 1, the numbers being centrally located above or preferably, below, the text.

* * * * *

13. By adding paragraph (d) to § 1.55 to read as follows:

§ 1.55 *Serial number and filing date of application.*

* * * * *

(d) The filing date of an international application designating the United States of America shall be treated as the filing date in the United States of America under PCT Article 11(3), except as provided in 35 U.S.C. 102(e).

14. By revising § 1.57 to read as follows:

§ 1.57 *Signature.*

(a) The application must be signed by the applicant in person. The signature to the oath or declaration under § 1.65 will be accepted as the signature to the application provided the oath or declaration under § 1.65 is attached to and refers to the specification and claims to which it applies. Otherwise the signature must appear at the end of the specification after the claims.

(b) The signature to the oath or declaration under § 1.70 will be accepted as the signature to the application provided the oath or declaration under § 1.70 specifically refers to the specification and claims to which it applies.

(c) Full names must be given, including at least one given name without abbreviation together with any other given name or initial.

15. By revising § 1.58 to read as follows:

§ 1.58 *Chemical and mathematical formulas and tables.*

(a) The specification, including the claims, may contain chemical and mathematical formulas, but shall not contain drawings or flow diagrams. The description portion of the specification may contain tables; claims may contain tables either if necessary to conform to 35 U.S.C. 112 or if otherwise found to be desirable.

(b) All tables and chemical and mathematical formulas in the specification, including claims, and amendments thereto, must be on paper which is flexible, strong, white, smooth, nonshiny and durable in order to permit use as camera copy when printing any patent which may issue. A good grade of bond paper is acceptable; watermarks should not be prominent. India ink or its equivalent, or solid black typewriter, should be used to secure perfectly black solid lines.

(c) To facilitate camera copying when printing, the width of formulas and tables as presented should be limited

normally to 5 inches (12.7 cm.) so that it may appear as a single column in the printed patent. If it is not possible to limit the width of a formula or table to 5 inches (12.7 cm.), it is permissible to present the formula or table with a maximum width of 10¾ inches (23.3 cm.) and to place it sideways on the sheet. Type-written characters used in such formulas and tables must be from a block (nonscript) type font or lettering style having capital letters which are at least 0.08 inch (2.1 mm.) high (e.g., elite type). Hand lettering must be neat, clean, and have a minimum character height of 0.08 inch (2.1 mm.). A space at least ¼ inch (6.4 mm.) high should be provided between complex formulas and tables and the text. Tables should have the lines and columns of data closely spaced to conserve space, consistent with high degree of legibility.

16. By adding a new § 1.61 to read as follows:

§ 1.61 *Filing of applications in the United States of America as a Designated Office.*

(a) To maintain the benefit of the international filing date and obtain an examination as to the patentability of the invention in the United States, the applicant shall furnish to the United States Patent and Trademark Office not later than the expiration of 20 months from the priority date: (1) a copy of the international application with any amendments, unless it has been previously furnished by the International Bureau or unless it was originally filed in the United States Patent and Trademark Office; (2) a verified translation of the international application and a translation of any amendments into the English language, if originally filed elsewhere in another language; (3) the national fee (see § 1.445(a)(4)); and (4) an oath or declaration of the inventor (see § 1.70).

(b) Where an International Searching Authority has made a declaration that no international search report will be established because the international application relates to subject matter which it is not required to search, or because the application fails to comply with the prescribed requirements to such an extent that a meaningful search could not be carried out, the time for performing the acts referred to in paragraph (a) of this section is two months from the mailing date of the declaration to the applicant.

17. By adding a new § 1.70 to read as follows:

§ 1.70 *Content of oath or declaration relating to content of and amendments to an application under 35 U.S.C. 371 (c)(4).*

(a)(1) When an applicant of an international application, if the inventor, desires to enter the national stage under 35 U.S.C. 371, he or she must specifically identify the international application and any amendments thereto and state that he or she has reviewed the referred to application and any amendments, and that he or she verily believes himself or herself to be the original and first inventor or discoverer of the process, machine, manufacture, composition of matter, or improvement thereof, for which he or she solicits a patent; that he or she does not know and does not believe that the same was ever known or used in the United States of America before his or her invention or discovery thereof, and shall state of what country he or she is a citizen and where he or she resides and whether he or she is a sole or joint inventor of the invention claimed in his or her international application as filed or as amended. In every application the applicant must distinctly state that to the best of his or her knowledge and belief the invention has not been in public use or on sale in the United States of America more than one year prior to his or her international application, or patented or described in any printed publication in any country before his or her invention or more than one year prior to his or her international application, or patented or made the subject of an inventor's certificate in any foreign country prior to the date of his or her international application on an application filed by himself or herself or his or her legal representatives or assigns more than twelve months prior to his or her international application. He or she must acknowledge a duty to disclose information he or she is aware of which is material to the examination of the application. He or she shall state whether or not any application for patent or inventor's certificate on the same invention has been filed in any foreign country, either by himself or herself, or by his or her legal representatives or assigns. If any such application has been filed, the applicant shall name the country in which the earliest such application was filed, and shall give the day, month, and year of its filing; he or she shall also identify by country and by day, month, and year of filing, every such foreign application filed more than twelve months before the filing of the international application.

(2) This statement (i) must be subscribed to by the applicant, and (ii) must either (a) be sworn to (or affirmed) as provided in § 1.66, or (b) include the personal declaration of the applicant as prescribed in § 1.68.

(b) If the international application was made as provided in §§ 1.422, 1.423 or 1.425, the applicant shall state his or her relationship to the inventor and, upon information and belief, the facts which the inventor is required by this section to state.

18. By revising paragraph (b) of § 1.72 to read as follows:

§ 1.72 *Title and abstract.*

* * * * *

(b) A brief abstract of the technical disclosure in the specification must be set forth on a separate sheet, preferably following the claims under the heading "Abstract of the Disclosure." The purpose of the abstract is to enable the Patent and Trademark Office and the public generally to determine quickly from a cursory inspection the nature and gist of the technical disclosure. The abstract shall not be used for interpreting the scope of the claims.

19. By revising the text and heading of § 1.77 to read as follows:

§ 1.77 *Arrangement of application elements.*

The elements of the application should appear in the following order:

(a) Title of the invention; or an introductory portion stating the name, citizenship, and residence of the applicant, and the title of the invention may be used.
(b) (Reserved).
(c) Cross-references to related applications, if any.
(d) Brief summary of the invention.
(e) Brief description of the several views of the drawing, if there are drawings.
(f) Detailed description.
(g) Claim or claims.
(h) Signature. (See § 1.57).
(i) Abstract of the disclosure.
(j) Drawings.

20. By revising paragraph (a) of § 1.78 to read as follows:

§ 1.78 *Cross-references to other applications.*

When an applicant files an application claiming an invention disclosed in a prior filed copending national application or international application designating the United States of America of the same applicant, the second application must contain or be amended to contain in the first sentence of the specification following the title a reference to such prior application, identifying it by serial number and filing date or international application number and international filing date and indicating the relationship of the applications, if the benefit of the filing date of such prior application is to be claimed. Cross-references to other related applications may be made when appropriate. (See § 1.14(b)).

21. By revising paragraphs (a), (b), (c), (d), (e), (f), (i), (j) and (l) of § 1.84 to read as follows:

§ 1.84 *Standards for drawings.*

(a) *Paper and ink.* Drawings must be made upon paper which is flexible, strong, white, smooth, non-shiny and durable. Two-ply or three-ply bristol board is preferred. The surface of the paper should be calendered and of a quality which will permit erasure and correction with India ink. India ink, or its equivalent in quality, is preferred for pen drawings to secure perfectly black solid lines. The use of white pigment to cover lines is not normally acceptable.

(b) *Size of sheet and margins.* The size of the sheets on which drawings are made may either be exactly 8½ by 14 inches (21.6 by 35.6 cm.) or exactly 21.0 by 29.7 cm. (DIN size A4). All drawing sheets in a particular application must be the same size. One of the shorter sides of the sheet is regarded as its top.

(1) On 8½ by 14 inch drawing sheets, the drawing must include a top margin of 2 inches (5.1 cm.) and bottom and side margins of ¼ inch (6.4 mm.) from the edges, thereby leaving a "sight" precisely 8 by 11¾ inches (20.3 by 29.8 cm.). Margin border lines are not permitted. All work must be included within the "sight". The sheets may be provided with two ¼ inch (6.4 mm.) diameter holes having their centerlines spaced 11/16 inch (17.5 mm.) below the top edge and 2¾ inches (7.0 cm.) apart, said holes being equally spaced from the respective side edges.

(2) On 21.0 by 29.7 cm. drawing sheets, the drawing must include a top margin of at least 2.5 cm., a left side margin of 2.5 cm., a right side margin of 1.5 cm., and a bottom margin of 1.0 cm. Margin border lines are not permitted. All work must be contained within a sight size not to exceed 17 by 26.2 cm.

(c) *Character of lines.* All drawings must be made with drafting instruments or by a process which will give them satisfactory reproduction characteristics. Every line and letter must be durable, black, sufficiently dense and dark, uniformly thick and well defined; the weight of all lines and letters must be heavy enough to permit adequate reproduction. This direction applies to all lines however fine, to shading, and to lines representing cut surfaces in sectional views. All lines must be clean, sharp, and solid. Fine or crowded lines should be avoided. Solid black should not be used for sectional or surface shading. Freehand work should be avoided wherever it is possible to do so.

(d) *Hatching and shading.* (1) Hatching should be made by oblique parallel lines spaced sufficiently apart to enable the lines to be distinguished without difficulty. (2) Heavy lines on the shade side of objects should preferably be used except where they tend to thicken the work and obscure reference characters. The light should come from the upper left-hand corner at an angle of 45°. Surface delineations should preferably be shown by proper shading, which should be open.

(e) *Scale.* The scale to which a drawing is made ought to be large enough to show the mechanism without crowding when the drawing is reduced in size to two-thirds in reproduction, and views of portions of the mechanism on a larger scale should be used when necessary to show details clearly; two or more sheets should be used if one does not give sufficient room to accomplish this end, but the number of sheets should not be more than is necessary.

(f) *Reference characters.* The different views should be consecutively numbered figures. Reference numerals (and letters, but numerals are preferred) must be plain, legible and carefully formed, and not be encircled. They should, if possible, measure at least one-eighth of an inch (3.2 mm.) in height so that they may bear reduction to one twenty-fourth of an inch (1.1 mm.); and they may be slightly larger when there is sufficient room. They should not be so placed in the close and complex parts of the drawing as to interfere with a thorough comprehension of the same, and therefore should rarely cross or mingle with the lines. When necessarily grouped around a certain part, they should be placed at a little distance, at the closest point where there is available space, and connected by lines with the parts to which they refer. They should not be placed upon hatched or shaded surfaces but when necessary, a blank space may be left in the hatching or shading where the character occurs so that it shall appear perfectly distinct and separate from the work. The same part of an invention appearing in more than one view of the drawing must always be designated by the same character, and the same character must never be used to designate different parts. Reference signs not mentioned in the description shall not appear in the drawing, and vice versa.

* * * * *

(l) *Views.* The drawing must contain as many figures as may be necessary to show the invention; the figures should be consecutively numbered if possible in the order in which they appear. The figures may be plan, elevation, section, or perspective views, and detail views of portions of elements, on a larger scale if necessary, may also be used. Exploded views, with the separated parts of the same figure embraced by a bracket, to show the relationship or order of assembly of various parts are permissible. When necessary, a view of a large machine or device in its entirety may be broken and extended over several sheets if there is no loss in facility of understanding the view. Where figures on two or more sheets form in effect a single complete figure, the figures on the several sheets should be so arranged that the complete figure can be understood by laying the drawing sheets adjacent to one another. The arrangement should be such that no part of any of the figures appearing on the various sheets are concealed and that the complete figure can be understood even though spaces will occur in the complete figure because of the margins on the drawing sheets. The plane upon which a sectional view is taken should be indicated on the general view by a broken line, the ends of which should be designated by numerals corresponding to the figure number of the sectional view and have arrows applied to indicate the direction in which the view is taken. A moved position may be shown by a broken line superimposed upon a suitable figure if this can be done without crowding, otherwise a separate figure must be used for this purpose. Modified forms of construction can only be shown in separate figures. Views should not be connected by projection lines nor should center lines be used.

(j) *Arrangement of views.* All views on the same sheet should stand in the same direction and, if possible, stand so that they can be read with the sheet held in an upright position. If views longer than the width of the sheet are necessary for the clearest illustration of the invention, the sheet may be turned on its side so that the top of the sheet with the appropriate top margin is on the right-hand side. One figure must not be placed upon another or within the outline of another.

* * * * *

(1) *Extraneous matter.* Identifying indicia (such as the attorney's docket number, inventor's name, number of sheets, etc.) not to exceed 2¾ inches (7.0 cm.) in width may be placed in a centered location between the side edges within three-fourths inch (19.1 mm.) of the top edge. Authorized security markings may be placed on the drawings provided they are outside the illustrations and are removed when the material is declassified. Other extraneous matter will not be permitted upon the face of a drawing.

* * * * *

22. By adding new paragraphs (c) and (d) to § 1.104 to read as follows:

§ 1.104 *Nature of examination; examiner's action.*

* * * * *

(c) An international-type search will be made in all national applications filed on and after June 1, 1978.

(d) Any national application may also have an international-type search report prepared thereon at the time of the national examination on the merits, upon specific written request therefor and payment of the international-type search report fee. See § 1.21(w) for amount of fee for preparation of international-type search report.

NOTE: The Patent and Trademark Office does not require that a formal report of an international-type search be prepared in order to obtain a search fee refund in a later filed international application.

23. By revising § 1.141 to read as follows:

§ 1.141 *Different inventions in one application.*

(a) Two or more independent and distinct inventions, that is, inventions which do not form a single general inventive concept, may not be claimed in one application, except that more than one species of an invention, not to exceed a reasonable number, may be specifically claimed in different claims in one application, provided the application also includes an allowable claim generic to all the claimed species and all the claims to species in excess of one are written in dependent form (§ 1.75) or otherwise include all the limitations of the generic claim.

(b) A group of claims of different categories in an application so linked as to form a single inventive concept are considered to be one invention. In particular any of the following groupings of claims of different categories may be included in the same application:

(1) in addition to a claim for a given product, (*a*) a claim for one process specially adapted for the manufacture of the said product, as where the process of making as claimed cannot be used to make other and materially different products; (*b*) a claim for one use of the said product, as where said use as claimed cannot be

practiced with another materially different product; or (c) both (a) and (b):

(ii) in addition to a claim for a given process, a claim for one apparatus or means specifically designed for carrying out of the said process, that is, it cannot be used to practice another materially different process.

(c) If the situation of subparagraph (1) of paragraph (b) of this section exists where claims to all three categories, product, process and use, are included, and the product claims are not allowable, the use and process claims are not so linked as to form a single general inventive concept. Where the process and use claims are not so joined by an allowable linking product claim, the applicant will be required to elect either the use or the process for prosecution with the product claim.

24. By revising § 1.146 to read as follows:

§ 1.146 *Election of species.*

In the first action on an application containing a generic claim and claims restricted separately to each of more than one species embraced thereby, the examiner may require the applicant in his response to that action to elect that species of his or her invention to which his or her claims shall be restricted if no generic claim is held allowable. However, if such application contains claims directed to more than a reasonable number of species, the examiner may require restriction of the claims to not more than a reasonable number of species before taking further action in the case.

25. By adding a new § 1.318 to read as follows:

§ 1.318 *Notification of national publication of a patent based on an international application.*

The Office will notify the International Bureau when a patent is issued on an application filed under 35 U.S.C. 371, and there has been no previous international publication.

26. By revising paragraphs (a) and (c) of § 1.331 to read as follows:

§ 1.331 *Recording of assignments.*

(a) Assignments, including grants and conveyances, of patents, national applications, or international applications which designate the United States of America, will be recorded in the Patent and Trademark Office under 35 U.S.C. 261. Other instruments affecting title to a patent, a national application, or an international application which designates the United States of America, and licenses, even though the recording thereof may not serve as constructive notice under 35 U.S.C. 261, will be recorded as provided in this section or at the discretion of the Commissioner.

* * * * *

(c) An instrument relating to a patent should identify the patent by number and date (the name of the inventor and title of the invention as stated in the patent should also be given); an instrument relating to a national application, or an international application which designates the United States of America should identify the application by serial number or international application number and date of filing (the name of the inventor and title of the invention as stated in the application should also be given), but if an assignment is executed concurrently with or subsequent to the execution of the application but before the application is filed or before its serial number or international application number and filing date are ascertained, it should adequately identify the application, as by its date of execution and name of the inventor and title of the invention; so that there can be no mistake as to the patent or application intended.

Subpart C

27. By adding a new § 1.401 to read as follows:

§ 1.401 *Definitions of terms under the Patent Cooperation Treaty.*

(a) The abbreviation "PCT" and the term "Treaty" mean the Patent Cooperation Treaty.

(b) "International Bureau" means the World Intellectual Property Organization located in Geneva, Switzerland.

(c) "Administrative Instructions" means that body of instructions for operating under the Patent Cooperation Treaty referred to in PCT Rule 89.

(d) "Request", when capitalized, means that element of the international application described in PCT Rules 3 and 4.

(e) "International application", as used in this Subchapter is defined in § 1.9(b).

(f) "Priority date" for the purposes of computing time limits under the Patent Cooperation Treaty is defined in PCT Art. 2 (xi). Note also § 1.465.

(g) Other terms and expressions in this Subpart C not defined in this section are to be taken in the sense indicated in PCT Art. 2 and 35 U.S.C. 351.

28. By adding a new § 1.412 to read as follows:

§ 1.412 *The United States Receiving Office.*

(a) The United States Patent and Trademark Office is a Receiving Office only for applicants who are residents or nationals of the United States of America.

(b) The Patent and Trademark Office, when acting as a Receiving Office, will be identified by the full title "United States Receiving Office" or by the abbreviation "RO/US."

(c) The major functions of the Receiving Office include:

(1) According of international filing dates to international applications meeting the requirements of PCT Art. 11(1), and PCT Rule 20;

(2) Assuring that international applications meet the standards for format and content of PCT Art. 14(1), PCT Rules 9, 26, 29.1, 37, 38, 91, and portions of PCT Rules 3 through 11:

(3) Collecting and, when required, transmitting fees due for processing international applications (PCT Rules 14, 15, 16);

(4) Transmitting the record and search copies to the International Bureau and International Searching Authority, respectively (PCT Rules 22 and 23); and

(5) Determining compliance with applicable requirements of Part 5 of this chapter.

29. By adding a new § 1.413 to read as follows:

§ 1.413 *The United States International Searching Authority.*

(a) Pursuant to appointment by the Assembly, the United States Patent and Trademark Office will act as an International Searching Authority for international applications filed in the United States Receiving Office and in other Receiving Offices as may be agreed upon by the Commissioner, in accordance with agreement between the Patent and Trademark Office and the International Bureau (PCT Art. 16(3)(b)).

(b) The Patent and Trademark Office, when acting as an International Searching Authority, will be identified by the full title "United States International Searching Authority" or by the abbreviation "ISA/US."

(c) The major functions of the International Searching Authority include:

(1) Approving or establishing the title and abstract;

(2) Considering the matter of unity of invention;

(3) Conducting international and international-type searches and preparing international and international-type search reports (PCT Art. 15, 17 and 18, and PCT Rules 25, 33 to 45 and 47); and

(4) Transmitting the international search report to the applicant and the International Bureau.

30. By adding a new § 1.414 to read as follows:

§ 1.414 *The United States Designated Office.*

(a) The United States Patent and Trademark Office will act as a Designated Office for international applications in which the United States of America has been designated as a State in which patent protection is desired.

(b) The Patent and Trademark Office, when acting as a Designated Office during international processing will be identified by the full title "United States Designated Office" or by abbreviation "DO/US."

(c) The major functions of the United States Designated Office in respect to international applications in which the United States of America has been designated, include:

(1) Receiving various notifications throughout the international stage;

(2) Accepting for regular national patentability examination international applications which satisfy the requirements of 35 U.S.C. 371; and

(3) Conducting reviews under PCT Article 25 for those international applications declared withdrawn.

31. By adding a new § 1.415 to read as follows:

§ 1.415 *The International Bureau.*

(a) The International Bureau is the World Intellectual Property Organization located at Geneva, Switzerland. It is the international intergovernmental organization which acts as the coordinating body under the Treaty and the Regulations (PCT Art. 2 (xix) and 35 U.S.C. 351(h)).

(b) The major functions of the International Bureau include:

(1) Publishing of international applications and the International Gazette;

(2) Transmitting copies of international applications to Designated Offices;

(3) Storing and maintaining record copies; and

(4) Transmitting information to authorities pertinent to the processing of specific international applications.

32. By adding a new § 1.421 to read as follows:

§ 1.421 *Applicant for international application.*

(a) Only residents or nationals of the United States of America may file international applications in the United States Receiving Office.

(b) Although the United States Receiving Office will accept international applications filed by any resident or national of the United States of America for international processing, an international application designating the United States of America will be accepted by the Patent and Trademark Office for the national stage only if filed by the inventor or as provided in §§ 1.422, 1.423 or 1.425.

(c) International applications which do not designate the United States of America may be filed by the assignee or owner.

(d) The attorney or agent of the applicant may sign the international application Request and file the international application for the applicant if the international application when filed is accompanied by a separate power of attorney to that attorney or agent from the applicant. The separate power of attorney from the applicant may be submitted after filing if sufficient cause is shown for not submitting it at the time of filing. Note that paragraph (b) of this section requires that the applicant be the inventor if the United States of America is designated.

(e) Any indication of different applicants for the purpose of different Designated Offices must be shown on the Request portion of the international application.

(f) Changes in the person, name, or address of the applicant of an international application shall be made in accordance with PCT Rule 18.5.

33. By adding a new § 1.422 to read as follows:

§ 1.422 *When the inventor is dead.*

In case of the death of the inventor, the legal representative (executor, administrator, etc.) of the deceased inventor may file an international application which designates the United States of America.

34. By adding a new § 1.423 to read as follows:

§ 1.423 *When the inventor is insane or legally incapacitated.*

In case an inventor is insane or otherwise legally incapacitated, the legal representative (guardian, conservator, etc.) of such inventor may file an international application which designates the United States of America.

35. By adding a new § 1.424 to read as follows:

§ 1.424 *Joint Inventors.*

Joint inventors must jointly file an international application which designates the United States of America; the signature of either of them alone, or less than the entire number will be insufficient for an invention invented by them jointly, except as provided in § 1.425.

36. By adding a new § 1.425 to read as follows:

§ 1.425 *Filing by other than inventor.*

(a) If a joint inventor refuses to join in an international application which designates the United States of America or cannot be found or reached after diligent effort, the international application which designates the United States of America may be filed by the other inventor on behalf of himself or herself and the omitted inventor. Such an international application which designates the United States of America must be accompanied by proof of the pertinent facts and must state the last known address of the omitted inventor. The Patent and Trademark Office shall forward notice of the filing of the international application to the omitted inventor at said address.

(b) Whenever an inventor refuses to execute an international application which designates the United States of America, or cannot be found or reached after diligent effort, a person to whom the inventor has assigned or agreed in writing to assign the invention or who otherwise shows sufficient proprietary interest in the matter justifying such action may file the international application on behalf of and as agent for the inventor. Such an international application which designates the United States of America, must be accompanied by proof of the pertinent facts and a showing that such action is necessary to preserve the rights of the parties or to prevent irreparable damage, and must state the last known address of the inventor. The assignment, written agreement to assign or other evidence of proprietary interest, or a verified copy thereof, must be filed in the Patent and Trademark Office. The Office shall forward notice of the filing of the application to the inventor at the address stated in the application.

37. By adding a new § 1.431 to read as follows:

§ 1.431 *International application requirements.*

(a) An international application shall contain, as specified in the Treaty and the Regulations, a Request, a description, one or more claims, an abstract, and one or more drawings (where required). (PCT Art. 3(2) and Section 207 of the Administrative Instruction.)

(b) An international filing date will be accorded by the United States Receiving Office, at the time of receipt of the international application, provided that:

(1) The applicant is a United States resident or national (35 U.S.C. 361(a), PCT Art. 11(1)(i)).

(2) The international application is in the English language (35 U.S.C. 361(c), PCT Art. 11(1)(ii)).

(3) The international application contains at least the following elements (PCT Art. 11(1)(iii)):

(i) an indication that it is intended as an international application (PCT Rule 4.2);

(ii) the designation of at least one Contracting State of the International Patent Cooperation Union;

(iii) the name of the applicant, as prescribed (note § 1.422);

(iv) a part which on the face of it appears to be a description; and

(v) a part which on the face of it appears to be a claim.

(c) Payment of the basic portion of the international fee (PCT Rule 15.2) and the transmittal and search fees (§ 1.445) shall be made in full at the time the international application papers required by paragraph (b) of this section are deposited. Failure to make full payment on the same date as the deposit of the international application papers required by subparagraph (b) of this section will result in the international application being considered withdrawn (PCT Art. 14(3)(a)).

38. By adding a new § 1.432 to read as follows:

§ 1.432 *Designation of States and payment of designation fees.*

(a) The names of Designated States shall appear in the Request upon filing and must be indicated as set forth in Section 201 of the Administrative Instructions.

(b) The designation fees may be paid upon filing of the international application, but must be paid at the latest before the expiration of one year from the priority date (PCT Rule 15.4(b)). Failure to timely pay the designation fee for a particular Designated State will result in the withdrawal of that designation (PCT Art. 14(3)(b)). Failure to timely pay at least one designation fee will result in the withdrawal of the international application (PCT Art. 14(3)(a)).

39. By adding a new § 1.433 to read as follows:

§ 1.433 *Physical requirements of international application.*

(a) The international application and each of the documents that may be referred to in the check list of the Request (PCT Rule 3.3(a)(ii)) shall be filed in one copy only.

(b) All sheets of the international application must be on A4 size paper (21.0 x 29.7 cm.).

(c) Other physical requirements for international applications are set forth in PCT Rule 11 and Sections 201–207 of the Administrative Instructions.

40. By adding a new § 1.434 to read as follows:

§ 1.434 *The Request.*

(a) The Request shall be made on a standardized printed form (PCT Rules 3 and 4). Copies of such printed Request forms are available from the Patent and Trademark Office. Letters requesting such forms should be marked "Box PCT."

(b) The Check List portion of the Request form should indicate each document accompanying the international application on filing.

(c) All information, for example, addresses, names of States and dates, shall be indicated in the Request as required by PCT Rule 4 and Administrative Instructions 110 and 201.

(d) International applications which designate the United States of America shall include:

(1) The name, address and signature of the inventor, except as provided by §§ 1.421(d), 1.422, 1.423 and 1.425;

(2) A reference to any copending national application or international application designating the United States of America, if the benefit of the filing date for the prior copending application is to be claimed.

41. By adding a new § 1.435 to read as follows:

§ 1.435 *The description.*

(a) Requirements as to the content and form of the description are set forth in PCT Rules 5, 9, 10 and 11 and Administrative Instruction 204, and shall be adhered to.

(b) In international applications designating the United States the description must contain upon filing an indication of the best mode contemplated by the inventor for carrying out the claimed invention.

42. By adding a new § 1.436 to read as follows:

§ 1.436 *The claims.*

The requirements as to the content and format of claims are set forth in PCT Art. 6 and PCT Rules 6, 9, 10 and 11 and shall be adhered to. The number of the claims shall be reasonable, considering the nature of the invention claimed.

43. By adding a new § 1.437 to read as follows:

§ 1.437 *The drawings.*

(a) Subject to paragraph (b) of this section, when drawings are necessary for the understanding of the invention, or are mentioned in the description, they must be part of an international application as originally filed in the United States Receiving Office in order to maintain the international filing date during the national stage (PCT Art. 7).

(b) Drawings missing from the application upon filing will be accepted if such drawings are received within 30 days of the date of first receipt of the incomplete papers. If the missing drawings are received within the 30-day period, the international filing date shall be the date on which such drawings are received. If such drawings are not timely received, all references to drawings in the international application shall be considered non-existent (PCT Art. 14(2), Administrative Instruction 310).

(c) The physical requirements for drawings are set forth in PCT Rule 11 and shall be adhered to.

44. By adding a new § 1.438 to read as follows:

§ 1.438 *The abstract.*

(a) Requirements as to the content and form of the abstract are set forth in PCT Rule 8, and shall be adhered to.

(b) Lack of an abstract upon filing of an international application will not affect the granting of a filing date. However, failure to furnish an abstract within one month from the date of the notification by the Receiving Office will result in the international application being declared withdrawn.

45. By adding a new § 1.445 to read as follows:

§ 1.445 *International application filing and processing fees.*

(a) The following fees and charges are established by the Patent and Trademark Office under the authority of 35 U.S.C. 376:

(1) A transmittal fee (see 35 U.S.C. 361(d) and PCT Rule 14)_____ $35.00

(2) A search fee (see 35 U.S.C. 361(d) and PCT Rule 16)_____ $300.00

(3) A supplemental search fee when required (see PCT Art. 17(3)(a) and PCT Rule 40.2)_____ $200.00 per additional invention.

(4) The national fee, that is, the amount set forth as the filing fee under 35 U.S.C. 41(a)(1).

(5) A special fee when required (see 35 U.S.C. 372(c))_____ $10.00 per claim.

(b) The basic fee and designation fee portions of the international fee shall be as prescribed in PCT Rule 15.

46. By adding a new § 1.446 to read as follows:

§ 1.446 *Refund of international application filing and processing fees.*

(a) Money paid for international application fees, where paid by actual mistake or in excess, such as a payment not required by law or Treaty and its Regulations, will be refunded.

(b) Refunds of a portion of the search fee may be made if the international search report is wholly or partly based on an earlier international or international-type search (PCT Rules 16 and 41). The amount of the refund will be as determined by the examiner according to the value of the prior international-type search or international search as 90%, 45% or 0% of the international search fee. If the amount of the refund is not a multiple of $5.00, it will be rounded to the next higher multiple of $5.00. See § 1.26 for refund of a portion of the international search fee during subsequent national examination of the application.

(c) Refund of the supplemental search fees will be made if such refund is determined to be warranted by the Commmissioner or the Commissioner's designee acting under PCT Rule 40.2(c).

(d) The international and search fees will be refunded if no international filing date is accorded (PCT Rules 15.6 and 16.2).

47. By adding a new § 1.451 to read as follows:

§ 1.451 *The priority claim and priority document in an international application.*

(a) The claim for priority must be made on the Request (PCT Rule 4.10) in a manner complying with Section 110 and 201 of the Administrative Instructions.

(b) Whenever the priority of an earlier United States national application is claimed in an international application, the applicant may request in a letter of transmittal accompanying the international application upon filing with the United States Receiving Office, that the Patent and Trademark Office prepare a certified copy of the national application for transmittal to the International Bureau (PCT Art. 8 and PCT Rule 17). The fee for preparing a certified copy is stated in § 1.21(b) and 35 U.S.C. 41(11).

(c) If a certified copy of the priority document is not submitted together with the international application on filing, or, if the priority application was filed in the United States and a request and appropriate payment for preparation of such a certified copy do not accompany the international application on filing, the certified copy of the priority document must be transmitted directly by the applicant to the International Bureau within the time limit specified in PCT Rule 17.1(a).

48. By adding a new § 1.455 to read as follows:

§ 1.455 *Representation in international applications.*

(a) Applicants of international applications may be represented by attorneys or agents licensed to practice before the Patent and Trademark Office or by a common representative (PCT Art. 49, Rules 4.8 and 90 and § 1.341).

(b) Appointment of an agent, attorney or common representative (PCT Rule 4.8) must be effected either in the

Request form, signed by all applicants, or in a separate power of attorney submitted either to the United States Receiving Office or to the International Bureau.

(c) Powers of attorney and revocations thereof should be submitted to the United States Receiving Office until the issuance of the international search report.

(d) The addressee for correspondence will be as indicated in Section 108 of the Administrative Instructions.

49. By adding a new § 1.461 to read as follows:

§ 1.461 *Procedures for transmittal of record copy to the International Bureau.*

(a) Transmittal of the record copy of the international application to the International Bureau shall be made, at the option of the applicant, either by the United States Receiving Office or by the applicant. Subject to paragraph (b) of this section, any applicant who chooses to make such transmittal personally shall notify the United States Receiving Office to that effect in writing, by way of a notice filed together with the international application. Such notice shall also state whether the applicant wishes to collect the record copy at the United States Receiving Office or to have the record copy mailed directly to him. The record copy of an international application which was filed without being accompanied by such notice will be transmitted to the International Bureau by the United States Receiving Office (PCT Rule 22).

(b) An applicant may transmit the record copy to the International Bureau as provided in PCT Rule 22.2 only if the international application is filed with the United States Receiving Office before the expiration of 11 months from the priority date.

(c) No copy of an international application may be transmitted to the International Bureau, a foreign Designated Office, or other foreign authority by the United States Receiving Office or the applicant, unless the applicable requirements of Part 5 of this chapter have been satisfied.

50. By adding a new § 1.465 to read as follows:

§ 1.465 *Timing of application processing based on the priority date.*

(a) For the purpose of computing time limits under the Treaty, the priority date shall be defined as in PCT Art. 2(xi).

(b) When a claimed priority date is cancelled under PCT Rule 4.10(d) or considered not to have been made under PCT Rule 4.10(b), the priority date for the purposes of computing time limits will be the date of the earliest valid remaining priority claim of the international application, or if none, the international filing date.

(c) When corrections under PCT Art. 11(2), Art. 14(2) or PCT Rule 20.2(a)(i) or (iii) are timely submitted, and the date of receipt of such corrections falls later than one year from the claimed priority date or dates, the Receiving Office shall proceed under PCT Rule 4.10(d).

51. By adding a new § 1.468 to read as follows:

§ 1.468 *Delays in meeting time limits.*

Delays in meeting time limits during international processing of international applications may only be excused as provided in PCT Rule 82. For delays in meeting time limits in a national application, see § 1.137.

52. By adding a new § 1.471 to read as follows:

§ 1.471 *Corrections and amendments during international processing.*

(a) All corrections submitted to the United States Receiving Office must be in the form of replacement sheets and be accompanied by a letter that draws attention to the differences between the replaced sheets and the replacment sheets, except that the deletion of lines of text, the correction of simple typographical errors, and one addition or change of not more than five words per sheet may be stated in a letter and the United States Receiving Office will make the deletion or transfer the correction to the international application, provided that such corrections do not adversely affect the clarity and direct reproducibility of the application (PCT Rule 26.4).

(b) Amendments of claims submitted to the International Bureau shall be as prescribed by PCT Rule 46.

53. By adding a new § 1.475 to read as follows:

§ 1.475 *Changes in person, name, or address of applicants and inventors.*

All requests for a change in person, name or address of applicants and inventor should be sent to the United States Receiving Office until the time of issuance of the international search report. Thereafter requests for such changes should be submitted to the International Bureau.

54. By adding § 1.481 to read as follows:

§ 1.481 *Determination of unity of invention before the International Searching Authority.*

(a) Before establishing the international search report, the International Searching Authority shall determine whether the international application complies with the requirement of unity of invention as set forth in PCT Rule 13 and as set forth in §§ 1.141 and 1.146 except as modified below in this section.

(b) If the International Searching Authority considers that the international application does not comply with the requirements of unity of invention, it shall inform the applicant accordingly and invite the payment of additional fees (note § 1.445 and PCT Art. 17(3)(a) and PCT Rule 40). The applicant will be given a time period in accordance with PCT Rule 40.3 to pay the additional fees due.

(c) In the case of non-compliance with unity of invention and where no additional fees are paid, the international search will be performed on the invention first mentioned ("main invention") in the claims.

(d) Lack of unity of invention may be directly evident before considering the claims in relation to any prior art, or after taking the prior art into consideration, as where a document discovered during the search shows the invention claimed in a generic or linking claim lacks novelty or is clearly obvious, leaving two or more claims joined thereby without a common inventive concept. In such a case the International Searching Authority may raise the objection of lack of unity of invention.

55. By adding § 1.482 to read as follows:

§ 1.482 *Protest to lack of unity of invention.*

(a) If the applicant disagrees with the holding of lack of unity of invention by the International Searching Authority, additional fees may be paid under protest, accompanied by a request for refund and a statement setting forth reasons for disagreement or why the required additional fees are considered excessive, or both (PCT Rule 40.2(c)).

(b) Protests under paragraph (c) of this section will be examined by the Commissioner or the Commissioner's designee. In the event that the applicant's protest is determined to be justified, the additional fees or a portion thereof will be refunded.

(c) An applicant who desires that a copy of the protest and the decision thereon accompany the international search report when forwarded to the Designated Offices, may notify the International Searching Authority to that effect any time prior to the issuance of the international search report. Thereafter, such notification should be directed to the International Bureau (PCT Rule 40.2(c)).

56. By adding a new § 3.56 to read as follows:

§ 3.56 *Oath to be filed with United States Designated Office under 35 U.S.C. 371(c)(4).*

As a below named inventor, being duly sworn (or affirmed), I depose and say that:

My residence, post office address and citizenship are as stated below next to my name;

I verily believe I am the original, first and sole inventor (if only one name is listed below) or a joint inventor (if plural inventors are named below) of the invention entitled: _____ described and claimed in international application number_____ filed _____, and as amended on _____ (if any), which I have reviewed and for which I solicit a patent:

I do not know and do not believe the same was ever known or used in the United States of America before my or our invention thereof, or patented or described in any printed

publication in any country before my or our invention thereof or more than one year prior to my international application, that the same was not in public use or on sale in the United States of America more than one year prior to my international application, that the invention has not been patented or made the subject of an inventor's certificate issued before the date of my international application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve months prior to my international application, that I acknowledge my duty to disclose information of which I am aware which is material to the examination of this application, and that no application for patent or inventor's certificate on this invention has been filed in any country foreign to the United States of America prior to this application by me or my legal representatives or assigns except as follows: _____

_____

_____

(Full name of sole or first inventor)

_____ Date _____

(Inventor's signature)

_____

(Residence)

_____

(Citizenship)

_____

(Post Office Address)

_____

_____

(Full name of second joint inventor, if any)

_____ Date _____

(Inventor's signature)

_____

(Residence)

_____

(Citizenship)

_____

(Post Office Address)

_____

(Supply similar information and signature for third and subsequent joint inventors)

_____ } ss:

_____ }

Sworn to and subscribed before me this _____ day of _____, 19____.

_____

(Signature of notary or officer)

[SEAL]

_____

(Official character)

57. By adding a new § 3.57 to read as follows:

§ 3.57 *Declaration to be filed with United States Designated Office under 35 U.S.C. 371(c)(4).*

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name;

I verily believe I am the original, first and sole inventor (if only one name is listed below) or a joint inventor (if plural inventors are named below) of the invention entitled: _____

described and claimed in international application number _____ filed _____ and as amended on _____ (if any), which I have received and for which I solicit a patent;

I do not know and do not believe the same was ever known or used in the United States of America before my or our invention thereof, or patented or described in any printed publication in any country before my or our invention thereof or more than one year prior to my international application, that the same was not in public use or on sale in the United States of America more than one year prior to my international application, that the invention has not been patented or made the subject of an inventor's certificate issued before the date of my international application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve months prior to my international application, that I acknowledge my duty to disclose information of which I am aware which is material to the examination of this application, and that no application for patent or inventor's certificate on this invention has been filed in any country foreign to the United States of America prior to this application by me or my legal representatives or assigns, except as follows: _____

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

_____

(Full name of sole or first inventor)

_____ Date _____

(Inventor's signature)

_____

(Residence)

_____

(Citizenship)

_____

(Post Office Address)

_____

_____

(Full name of second joint Inventor, if any)

_____ Date _____

(Second Inventor's signature)

_____

(Residence)

_____

(Citizenship)

_____

(Post Office Address)

_____

(Supply similar information and signature for third and subsequent joint inventors)

58. By revising § 5.1 to read as follows:

§ 5.1 *Defense inspection of certain applications.*

(a) The provisions of this part shall apply to both national and international applications filed in the Patent and Trademark Office and, with respect to inventions made in the United States, to applications filed in any foreign country or any international authority other than the United States Receiving Office. The (1) filing of a national or an international application in a foreign country or with an international authority other than the United States Receiving Office, or (2) transmittal of an international application to a foreign agency or an international authority other than the United States Receiving Office is considered to be a foreign filing within the meaning of Chapter 17 of Title 35, United States Code.

(b) In accordance with the provisions of 35 U.S.C. 181, patent applications containing subject matter the disclosure of which might be detrimental to the national security are made available for inspection by defense agencies as specified in said section. Only applications obviously relating to national security, and applications within fields indicated to the Patent and Trademark Office by the defense agencies as so related, are made available. The inspection will be made only by responsible representatives authorized by the agency to review applications. Such representatives are required to sign a dated acknowledgement of access accepting the condition that information obtained from the inspection will be used for no purpose other than the administration of 35 U.S.C. 181–188. Copies of applications may be made available to such representatives for inspection outside the Patent and Trademark Office under conditions assuring that the confidentiality of the applications will be maintained, including the conditions that: (a) all copies will be returned to the Patent and Trademark Office promptly if no secrecy order is imposed, or upon rescission of such order if one is imposed, and (b) no additional copies will be made by the defense agencies. A record of the removal and return of copies made available for defense inspection will be maintained by the Patent and Trademark Office. Applications relating to atomic energy are made available to the Department of Energy as specified in § 1.14 of this chapter.

59. By revising § 5.3 to read as follows:

§ 5.3 *Prosecution of application under secrecy order; withholding patent.*

Unless specifically ordered otherwise, action on the application by the Office and prosecution by the applicant will proceed during the time an application is under secrecy order to the point indicated in this section:

(a) National applications under secrecy order which come to a final rejection must be appealed or otherwise prosecuted to avoid abandonment. Appeals in such cases must be completed by the applicant but unless otherwise specifically ordered by the Commissioner will not be set for hearing until the secrecy order is removed.

(b) An interference will not be declared involving national applications under secrecy order. However, if an applicant whose application under secrecy order copies claims from an issued patent, a notice of that fact will be placed in the file wrapper of the patent.

(c) When the national application is found to be in condition for allowance except for the secrecy order the applicant and the agency which caused the secrecy order to be issued will be notified. This notice (which is not a notice of allowance under § 1.311 of this chapter) does not require response by the applicant and places the national application in a condition of suspension until the secrecy order is removed. When the secrecy order is removed the Patent and Trademark Office will issue a notice of allowance under § 1.311 of this chapter, or take such other action as may then be warranted.

(d) International applications under secrecy order will not be mailed, delivered or otherwise transmitted to the international authorities or the applicant. International applications under secrecy order will be processed up to the point where, if it were not for the secrecy order, record and search copies would be transmitted to the international authorities or the applicant.

60. Section 5.11 text and heading are revised to read as follows:

§ 5.11 *License for filing application in foreign country or for transmitting international application.*

(a) When no secrecy order has been issued under § 5.2, a license from the Commissioner of Patents and Trademarks under 35 U.S.C. 184 is required before filing any application for patent or for the registration of a utility model, industrial design, or model, in a foreign country, or transmitting an international application to any foreign patent agency or any international agency other than the United States Receiving Office, or causing or authorizing such filing or transmittal, with respect to an invention made in the United States, if:

The foreign application is to be filed or its filing caused or authorized before a national or international application for patent is filed in the United States, or

(2) The foreign application is to be filed, or its filing caused or authorized, or the transmittal of the international application is caused or authorized, prior to the expiration of six months from the filing of the application in the United States.

(b) When there is no secrecy order in effect, a license under 35 U.S.C. 184 is not required if:

(1) The invention was not made in the United States, or

(2) The foreign application is to be filed or the international application is to be transmitted, or its filing or transmittal caused or authorized, after the expiration of six months from the filing of the national application in the United States.

(c) When a secrecy order has been issued under § 5.2, an application cannot be filed in a foreign country, nor can an international application be transmitted to any agency other than the United States Receiving Office except in accordance with § 5.5.

61. By revising text of heading of § 5.13 to read as follows:

§ 5.13 *Petition for license; no corresponding application.*

Where there is no corresponding national or international application, the petition for license must be accompanied by a legible copy of the material upon which license is desired. This copy will be retained as a measure of the license granted. For assistance in the identification of the subject matter of each license so issued, it is suggested that the petition or requesting letter be submitted in duplicate and provide a title and other description of the material. The duplicate copy of the petition will be returned with the license or other action on the petition. Where an international application is being filed in the United States Receiving Office, the petition may accompany the international application.

62. By revising paragraphs (b) and (c) of § 5.14 to read as follows:

§ 5.14 *Petition for license; corresponding U.S. application.*

* * * * *

(b) Two or more United States applications should not be referred to in the same petition for license unless they are to be combined in the foreign or international application, in which event the petition should so state and the identification of each United States application should be in separate paragraphs.

(c) Where the application to be filed or transmitted abroad contains matter not disclosed in the United States application or applications, including the case where the combining of two or more United States applications introduces subject matter not disclosed in any of them, a copy of the application as it is to be filed in the foreign country or international application which is to be transmitted to a foreign international or national agency as it is to be filed in the Receiving Office must be furnished with the petition. If, however, all new matter in the foreign or international application to be filed is readily identifiable, the new matter may be submitted in detail and the remainder by reference to the pertinent United States application or applications.

63. By revising § 5.15(a) to read as follows:

§ 5.15 *Scope of license.*

(a) A license to file an application in a foreign country or transmit an international application to any foreign or international agency other than the United States Receiving Office, when granted, includes authority to forward all duplicate and formal papers to the foreign country or international agencies and to make amendments and take any action in the prosecution of the foreign or international application, provided subject matter additional to that covered by the license is not involved. In those cases in which no license is required to file the foreign application or transmit the international application, no license is required to file papers in connection with the prosecution of the foreign or international application not involving the disclosure of additional subject matter. Any paper filed abroad or with an international agency following the filing of a foreign or international application which involves the disclosure of additional subject matter must be separately licensed in the same manner as a foreign or international application.

* * * * *

64. By revising § 5.17 to read as follows:

§ 5.17 *Who may use license.*

Licenses may be used by anyone interested in the foreign filing or international transmittal for or on behalf of the inventor or the inventor's assigns.

AUTHORITY: 35 U.S.C. 6, Public Law 94-131 (89 Stat. 685).

Date: April 25, 1978.

LUTRELLE F. PARKER,
Acting Commissioner of Patents, and Trademarks.

Approved: May 5, 1978.

JORDAN J. BARUCH,
Assistant Secretary for Science and Technology.

(This rule promulgation is being printed in the OFFICIAL GAZETTE without using the arrow and bracket format to show additions and deletions because of the substantial rewriting of many of the rules and in view of the short time period available before printing.)

Set V of Addenda to the Classification Definitions

The definitions of the classes listed below were modified by addenda as part of Classification Orders 594 to 604 issued between July 1, 1977 and September 30, 1977. All of these addenda have been consolidated into Set V of "Addenda to the Classification Definitions."

Class	*Class*	*Class*	*Class*
4	105	206	325
8	106	210	328
10	112	219	329
12	118	221	330
15	123	222	331
29	128	229	332
30	136	239	333
49	137	244	335
52	138	248	337
53	140	250	346
55	144	251	350
60	145	252	352
62	156	260	361
65	157	279	407
72	164	285	408
73	165	295	415
76	173	299	417
81	174	307	424
83	179	310	425
89	181	315	427
90	184	318	428
96	193	322	530–570 classes (542, 544, 548)
98	200	323	
100	204	324	530–570 classes (560)

ALFRED C. MARMOR,
Administrator for Documentation,
April 10, 1978.

Set VI of Addenda to the Classification Definitions

The definitions of the classes listed below were modified by addenda as part of Classification Orders 605 to 611 issued between October 1, 1977 and December 30, 1977. All of these addenda have been consolidated into Set VI of "Addenda to the Classification Definitions."

Class	*Class*	*Class*	*Class*
2	119	212	322
5	124	214	324
9	126	219	325
15	127	220	328
16	128	222	330
19	132	224	332
21	134	233	333
23	135	235	334
29	137	239	335
30	138	240	337
32	141	241	338
33	149	242	339
34	156	244	340
35	159	246	343
37	160	248	346
40	164	250	350
42	165	251	351
43	166	252	352
44	172	254	353
46	173	259	354
47	174	260	355
49	175	261	356
51	176	264	357
52	177	269	358
53	178	272	360
60	179	273	361
62	181	280	362
65	185	285	364
68	187	294	366
69	191	296	401
70	193	299	404
73	195	302	408
74	198	303	415
99	200	307	416
100	201	310	425
106	202	312	428
108	203	313	431
112	206	314	432
116	208	315	520 classes (526)
118	209	318	
	210	320	

ALFRED C. MARMOR,
Administrator for Documentation,
April 26, 1978.

January–March 1978 Classification Orders

The reclassifications covered by the following classification changes became effective between January and March 1978.

	Class	*Subclasses*
Classification Order 612, effective January 3, 1978:		
Abolished	340	173; 173.1; 173.2; 174.
Established (New)	365	1–244.
Classification Order 613, effective February 3, 1978:		
Abolished	235	61.5–61.12.
Established	235	400–495.
Classification Order 614, effective February 7, 1978:		
Abolished	73	388; 389; 391–420.
Established	73	700–756.
Classification Order 615, effective February 8, 1978:		
Abolished	219	59; 76; 78; 86; 91; 117; 124; 125; 130; 131; 135; 145; 146.
Established	219	56.1; 56.21; 56.22; 59.1; 60.2; 61.1; 61.11–61.13; 61.2; 61.3; 61.4; 61.5; 61.6; 61.7; 73.1; 73.11; 73.2; 73.21; 76.1; 76.11–76.17; 78.01; 78.02; 78.11–78.16; 86.1; 86.21–86.25; 86.31–86.33; 86.41; 86.51 86.61; 86.7; 86.8; 86.9; 91.1; 91.2; 91.21–91.23; 117.1; 124.01–124.03; 124.1; 124.21; 124.22; 124.31–124.34; 124.4; 124.5; 125.1; 125.11; 125.12; 130.01; 130.1; 130.21; 130.31–130.33; 130.4; 130.5; 130.51; 137.2; 137.31; 137.41–137.44; 137.51; 137.52; 137.61–137.63; 137.7; 137.71; 137.8; 137.9; 145.1; 145.21–145.23; 145.31; 145.32; 145.41; 146.1; 146.21–146.24; 146.3; 146.31; 146.32; 146.41; 146.51; 146.52.
Classification Order 616, effective March 1, 1978:		
Abolished	273	130–137; 152–152.7.
Established	273	236–309.
Classification Order 617, effective March 2, 1978:		
Abolished	19	155; 156; 156.1–156.4.
	425	80–83.
Established	19	296–308.
	425	80.1; 81.1; 82.1; 83.1.
Classification Order 618, effective March 3, 1978:		
Established	526	323.1; 323.2.
Title change	526	321.
Classification Order 619, effective March 6, 1978:		
Established	235	375–386.
Classification Order 620, effective March 6, 1978:		
Abolished	4	S; 10–110.
Established	4	113.1; 114.1; 144.1–144.4; 222.1; 300–442.
	308	6.1.
Classification Order 621, effective March 9, 1978:		
Abolished	350	1–3; 3.5; 4–7; 96; 160; 161.
Established	350	1.1–1.7; 3.60–3.86; 4.1; 4.2; 6.1–6.91; 96.10–96.34; 330–352; 353–363.
Classification Order 622, effective March 22, 1978:		
Abolished	40	28–106.54; 125–145.
Established	40	361–624 and 900–907.
Classification Order 623, effective March 24, 1978:		
Abolished	7	All.
Established (New)	7	100–170.
		Cross reference art collection. 900; 901.
Classification Order 624, effective March 30, 1978:		
Abolished	106	287.
Established	106	287.1–287.35.
		Cross reference art collection. 900; 901.

ALFRED C. MARMOR,
Administrator for Documentation,
April 10, 1978.

Board of Appeals Decisions Rendered in the Month of April 1978

Affirmed	162
Affirmed in Part	25
Reversed	63
Total	250

Subscription Pricing

The U.S. Government Printing Office advises that effective immediately, the subscription price of the OFFICIAL GAZETTE, Patents, has been changed as indicated below:

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Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

The subscription price of the OFFICIAL GAZETTE, Trademarks, has not been changed and remains at $88.40 per annum, domestic. Foreign mailing is $22.10 additional. Single copies are $1.70 each.

RICHARD J. SHAKMAN,
Assistant Commissioner for Administration.

May 9, 1978.

Regulations Relating to the Use of Patent and Trademark Office Records Facilities

Establishment of Enforcement Procedures

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Notice.

SUMMARY: The Patent and Trademark Office is adopting procedures for enforcing existing regulations governing the use of the Public Search Room for Patents and the Patent Examining Group Search Facilities by members of the public. Enforcement of the existing regulations is necessary, and is intended by these procedures, to carry out the commitment of the Office to the public to promote an atmosphere conducive to research and maintain the integrity of the files in the Public Search Room for Patents and in the Examining Group Search Facilities.

EFFECTIVE DATE: 6-30-78.

FOR FURTHER INFORMATION CONTACT: Bradford R. Hunter, Deputy Assistant Commissioner for Administration, Patent and Trademark Office, Washington, D.C. 20231, (703) 557-2290.

SUPPLEMENTARY INFORMATION: The procedures will apply in enforcing the regulations for the public use of records of the Public Search Room for Patents and the Patent Examining Group Search Facilities. The regulations of the Public Search Room for Patents were published in the Federal Register for July 14, 1976, 41 F.R. 29009, and incorporated in a Search Room User Agreement entered into by each person who is issued a User Pass. Regulations for Users of the Patent Examining Group Search Facilities were established under Rule 2 of the regulations of the Public Search Room for Patents and were published in the OFFICIAL GAZETTE of March 22, 1977, 956 O.G. 1118. The procedures appear below.

PROCEDURES FOR ENFORCEMENT OF THE REGULATIONS FOR THE PUBLIC USE OF RECORDS IN THE PUBLIC SEARCH ROOM FOR PATENTS AND THE PATENT EXAMINING GROUP SEARCH FACILITIES

Under applicable statutes and regulations, including 40 U.S.C. 486(c); 41 CFR 101-20.3; and appropriate sections of Department Organization Orders 30-3A and 30-3B of the Department of Commerce, the procedures appearing below are established.

VIOLATION INVOLVING THE SECURITY SYSTEM

1. *Unauthorized removal of government property.*

(a) The Public Search Room for Patents is equipped with a security system designed to sound an alarm when an attempt to remove government property from the Public Search Room is detected. Each alarm signal triggered by a person passing through an exit to the Public Search Room will be investigated by security guards stationed at the Public Search Room exits. The person involved will be required to stop and allow the security guards to determine the cause of the alarm. If non-government property is the cause for the alarm, the person will be allowed to proceed without further delay. If unauthorized possession of government property is found to be the cause of the alarm, the person in whose possession the property is found will be advised that a violation has occurred and will be required to surrender the property to the Manager of the Public Search Room. An oral explanation for the possession of such property will be requested by the Manager.

(b) The Manager of the Public Search Room will immediately report each incident involving unauthorized possession of government property to the Deputy Assistant Commissioner for Administration by telephone, and if requested submit a written report, together with the government property and User Pass involved to the Deputy Assistant Commissioner for Administration.

(3) If it shall appear to the Deputy Assistant Commissioner for Administration that unauthorized possession of government property, detected by the security system, was inadvertent or otherwise unintentional, no further action will be taken. Otherwise, the Deputy Assistant Commissioner for Administration will request the person involved to show cause in writing why his or her User Pass should not be suspended or revoked pursuant to the terms of the Search Room User Agreement. A written decision will be rendered by the Deputy Assistant Commissioner for Administration after consideration of any timely submitted response.

OTHER VIOLATIONS OF THE PUBLIC SEARCH ROOM REGULATIONS

2. *All other violations of the Public Search Room Regulations.*

(a) Each observed or reported violation will be investigated by the Manager of the Public Search Room. If a violation has occurred and is not denied, the person involved will be verbally requested by the Manager to comply with the regulations. If the person involved denies that a violation has occurred, or refuses to comply with a verbal request of the Manager to comply with the regulations, or violates the regulations after having agreed to comply with them, the person will be required to surrender his or her User Pass to the Manager of the Public Search Room.

(b) The Manager of the Public Search Room will submit a written report of each violation, and the User Pass, if surrendered, to the Deputy Assistant Commissioner for Administration.

(c) If the Deputy Assistant Commissioner for Administration is satisfied that a reported violation was inadvertent or otherwise unintentional, the User Pass, if surrendered, will be returned and no further action will be taken. In all other cases, the Deputy Assistant Commissioner for Administration will request the person involved to show cause in writing why his or her User Pass should not be suspended or revoked pursuant to the terms of the Search Room User Agreement. A written decision will be rendered by the Deputy Assistant Commissioner for Administration after consideration of any timely submitted response.

VIOLATIONS OF THE PATENT EXAMINING GROUP SEARCH FACILITIES REGULATIONS

3. *Violations of the Regulations for Users of the Patent Examining Group Search Facilities.*

(a) Each observed or reported violation will be investigated by Authorized Official. If a violation has occurred, and is not denied, the person involved will be verbally requested to comply with the regulations. If the person involved denies that a violation has occurred, or refuses to comply with a verbal request to comply with regulations, or violates the regulations after having agreed to comply with them, the person involved will be required to surrender his or her User Pass to the Authorized Official.

(b) The Authorized Official will submit a written report of each violation, and the User Pass, if surrendered, to the Deputy Assistant Commissioner for Patents.

(c) If the Deputy Assistant Commissioner for Patents is satisfied that violation was inadvertent or otherwise unintentional, the User Pass, if surrendered, will be returned and no further action will be taken. In all other cases, the

Deputy Assistant Commissioner for Patents will request the person involved to show cause in writing why his or her User Pass should not be suspended or revoked. A written decision will be rendered by the Deputy Assistant Commissioner for Patents after consideration of any timely submitted response.

PENALTIES

4. *Factors to be Considered in Assessing Penalties.*

(a) Penalties will be determined on a case-by-case basis. A record of penalties imposed for given violations will be kept and made available to the public upon request.

(b) Due weight may be given to prior violations of the regulations in assessing whether any given violation is willful, deliberate or intentional.

(c) Prior violations of the regulations will be considered in determining any specific penalty to be imposed. Depending upon the circumstances, the penalty for a first offense may range from an oral or written warning to a 60-day suspension of the User Pass. For a second offense, the penalty may be a suspension of from 5 days to 1 year. For a third offense, the penalty may range from a 30-day suspension to revocation of the User Pass.

GENERAL PROVISIONS

5. *Use of Search Facilities During Suspension or After Revocation of User Pass.*

No individual will be permitted to use the Public Search Room for Patents or the Patent Examining Group Search Facilities while his or her User Pass is suspended or revoked.

6. *Temporary User Pass.*

Any person whose User Pass was surrendered, but not suspended or revoked, may be issued a temporary User Pass which shall be valid until the User Pass is returned or a decision is rendered pursuant to paragraph 1(c), 2(c), 3(c).

7. *Absence of the Deputy Assistant Commissioner for Administration.*

In the absence of the Deputy Assistant Commissioner for Administration, the Director of the Office of Patent and Trademark Services will carry out the functions and responsibilities assigned to the Deputy Assistant Commissioner for Administration in paragraph 1(b) and (c) and 2(b) and (c).

8. *Absence of the Manager of the Public Search Room.*

In the absence of the Manager of the Public Search Room, the Acting Manager will carry out the duties and responsibilities assigned to the Manager in paragraphs 1(a), 1(b), 2(a) and 2(b).

9. *Assistance.*

The Manager of the Public Search Room and the Authorized Official may, when necessary request the Security Officer of the Patent and Trademark Office or the GSA to provide assistance in carrying out their functions in paragraphs 1(a), 2(a), and 3(a).

10. *Petitions.*

A decision rendered by the Deputy Assistant Commissioner for Administration, the Director of the Office of Patent and Trademark Services, or the Deputy Assistant Commissioner for Patents may be reviewed on petition to the Commissioner.

LUTRELLE F. PARKER,
May 5, 1978. *Acting Commissioner of Patents and Trademarks.*

Patent Cooperation Treaty Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) Implementation: Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of May 16, 1978.

LUTRELLE F. PARKER,
May 2, 1978. *Acting Commissioner of Patents and Trademarks.*

Patent Suits

Notices under 35 U.S.C. 290: Patent Act of 1952

3,231,512, R. W. Harter, ADSORPTION DEVICE; **3,313,630,** W. T. Harvey, Jr., PROCESS AND APPARATUS FOR PRESERVING ANIMAL AND PLANT MATTER; **3,313,631,** W. P. Jensen, APPARATUS FOR PRESERVING ANIMAL AND PLANT MATTER; **3,451,782,** same, CATALYTIC REACTOR, **filed** July 26, 1977, D.C., E.D. Wash. (Spokane), Doc. C–77–214, *Food Storage Systems, Inc.* v. *Crowder Refrigeration Inc. et al.* Notice of dismissal, Jan. 19, 1978.

3,313,631. (See 3,231,512.)

3,451,782. (See 3,231,512.)

3,516,539, E. G. Walter, WHEEL-CHAIR HANDLING APPARATUS, **filed** Dec. 14, 1977, D.C., N.D. Ohio (Cleveland), Doc. C–77–1260, *ABC Enterprises, Inc.* v. *Helper Industries, Inc., Helper Sales Corp. and Truckin' Vantastiks, Inc.*

3,526,415, A. Freundlich, HELICAL WIRE BOUND NOTEBOOK AND HELICAL BINDING THEREFOR; **3,568,729** Freundlich and Diakoff, DEVICES FOR CLIPPING AND LOOPING ENDS OF HELICAL BINDERS, **filed** Sept. 16, 1977, D.C., N.D. Tex. (Dallas), Doc. CA3–77–1257F, *Bielomatik Leuze & Company* v. *Southwest Tablet Manufacturing Company.*

3,543,977, J. E. Lockridge, PILOT LEG STRAP REFERENCE MATERIAL HOLDER; **3,828,696,** same, SAFETY KNEEBOARD, **filed** Feb. 13, 1978, United States Court of Claims (District of Columbia), Doc. 58–78, *James E. Lockridge* v. *The United States.*

3,568,729. (See 3,526,415.)

3,823,388, Chadima, Jr. and Bruce, DATA COLLECTION AND UTILIZATION SYSTEM; **3,991,299,** Chadima, Jr. and Ristola, BAR CODE SCANNER, **filed** Jan. 11, 1978, D.C. Iowa (Cedar Rapids), Doc. C–78–7, *Telxon Corporation* v. *Norand Corporation.* **Same, filed** Oct. 31, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c4029, *Norand Corporation* v. *Telxon Corporation.*

3,828,696. (See 3,543,977.)

3,849,833, W. D. Watt, Jr., COMPOSITE DRAWER HANDLE, **filed** Feb. 13, 1978, D.C. Conn. (New Haven), Doc. C–78–59–WS, *Keeler Corporation, doing business as Keeler Brass* v. *Stewart-Warner Corp., Bassick-Sack Division.*

3,869,608, S. A. Scherbatskoy, NUCLEAR WELL LOGGING, **filed** Feb. 8, 1978, D.C., W.D. Okla. (Oklahoma City), Doc. 78–0104–T, *Halliburton Company* v. *Gearhart-Owen Industries, Inc.*

3,897,879, L. Bubik, VEHICLE TOWING APPARATUS, **filed** Feb. 22, 1978, D.C., N.D. Calif. (San Francisco), Doc. C78–0392 WWS, *Vulcan Equipment Company, Ltd.* v. *John Baugh, doing business as House of Wreckers.*

3,899,627, Sitek and Berk, CRUCIBLE, **filed** Jan. 18, 1978, D.C., E.D., Mich. (Bay City), Doc. 78–10008, *Leco Corporation* v. *Ultra Carbon Corporation.*

3,948,380, H. Galin, COIN OPERATED VENDING MACHINE, **filed** Jan. 27, 1978, D.C., E.D. Pa. (Philadelphia), Doc. 78–322, *Universal Vendors, Inc.* v. *Fox Craft Division of Gulf & Western Industries and Valley Forge Marketing Corporation.*

3,949,522, Kehl and Crist, GREENHOUSE; **4,047,328,** same, **filed** May 11, 1977, D.C., N.D. Fla. (Pensacola), Doc. MCA–77–0217 *Hygroponics, Inc.* v. *American Greenhouse Systems, Inc.; W. J. White and Michael Koppel.*

3,991,299. (See 3,823,388.)

3,991,831, R. A. McIntosh, Sr., PRINT HEAD AND PLASTIC BEARINGS THEREFOR, **filed** June 14, 1977, D.C., S.D. Ill. (Peoria), Doc. 77–1056, *Lee Blacksmith, Inc.* v. *Lindsay Brothers, Inc.*

4,012,494, C. Ling, DIRECT RADIOIMMUNOSSAY FOR ANTIGENS AND THEIR ANTIBODIES, **filed** July 18, 1977, D.C., S.D.N.Y., Doc. 77–C–3438, *Electro-Nucleonics Laboratories, Inc.* v. *Abbott Laboratories.*

4,029,250, L. H. Tall, PHOTOGRAPHIC STRIP TRANSPORT INTERVAL CONTROL, **filed** Feb. 9, 1978, D.C. Minn. (Minneapolis), Doc. 4–78–C–64, *Pako Corporation* v. *CX Corporation.*

4,046,098, Beeson and Skinner, EDITING SYSTEM FOR CONTROLLING THE TRANSFER OF SELECTED VIDEO INFORMATION FROM A VIDEO SOURCE TO A VIDEO TAPE RECORDER, filed Oct. 27, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77-4019-WMB, *Convergence Corporation* v. *Datatron, Inc.*

4,046,923, Meng and Driessen, PACKAGE WITH STAGGERED PRODUCT SLICES AND PROCESS FOR PRODUCING THE SAME, filed Sept. 7, 1977, D.C., W.D. Pa. (Pittsburgh), Doc. 77-1032, *L. D. Schreiber Cheese Co., Inc.* v. *Clearfield Cheese Co., Inc.*

4,047,328. (See 3,949,522.)

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,433,952, Re. S.N. 894,649, Filed Apr. 7, 1978, Cl. 250/364, SPECTROPHOTOFLUOROMETER HAVING CORRECTION MEANS PROVIDING SUBSTANTIALLY EQUAL ENERGY EFFECTS IN RESPONSE AT DIFFERENT EXCITATION WAVELENGTHS, Hugh K. Howerton, Owner of Record: *Baxter Travenol Laboratories, Inc., Deerfield, Ill.,* Attorney or Agent: Paul C. Flattery, et al., Ex. Gp.: 256

3,481,422, Re. S.N. 892,008, Filed Mar. 30, 1978, Cl. 180/108, SPEED CONTROL APPARATUS FOR AN AUTOMOTIVE VEHICLE, Robert S. Mueller, et al., Owner of Record: *Eaton Yale & Towne Inc., Cleveland, Ohio,* Attorney or Agent: Roger A. Johnston, et al., Ex. Gp.: 316

3,482,854, Re. S.N. 890,864, Filed Mar. 24, 1978, Cl. 280/713, SUSPENSION STRUCTURE FOR AUTOMOTIVE VEHICLES, Lloyd D. Masser, Owner of Record: *Lear Siegler, Inc., Santa Monica, Calif.,* Attorney or Agent: John E. McGarry et al., Ex. Gp.: 316

3,499,302, Re. S.N. 843,309, Filed Dec. 13, 1977, Cl. 70/364, CYLINDER LOCK, Roy N. Oliver, et al., Owner of Record: *Mechanical Development Company, Incorporated, Salem, Va.,* Attorney or Agent: Richard C. Sughrue, et al., Ex. Gp.: 351

3,626,616, Re. S.N. 892,469, Filed Mar. 31, 1978, Cl. 40/63, LETTER AND NUMBER KITS AND THE PROCESS OF PREPARING SAME, Joseph P. Seme, Owner of Record: *Sem-Torq, Inc., Bedford Heights, Ohio,* Attorney or Agent: Charles B. Lyon, Ex. Gp.: 333

3,679,197, Re. S.N. 893,886, Filed Apr. 6, 1978, Cl. 267/152, COMPRESSIVE LOAD CARRYING BEARINGS, Warren E. Schmidt, Owner of Record: *Lord Corporation, Erie, Pa.,* Attorney or Agent: James W. Wright, Ex. Gp.: 313

3,977,454, Re. S.N. 893,885, Filed Apr. 6, 1978, Cl. 152/323, INTEGRAL PNEUMATIC TIRE AND WHEEL COMPRISING A WHEEL PORTION WITH AXIALLY SPACED MEMBERS, Aubert Y. Coran, et al., Owner of Record: *Monsanto Company, St. Louis, Mo.,* Attorney or Agent: L. R. Swaney, et al., Ex. Gp.: 314

3,980,990, Re. S.N. 883,046, Filed Mar. 2, 1978, Cl. 340/149 R, FERROMAGNETIC CURRENCY VALIDATOR, Arthur A. Berube, Owner of Record: *Inventor,* Attorney or Agent: Charles Hieken, Ex. Gp.: 234

3,995,132, Re. S.N. 893,887, Filed Apr. 6, 1978, Cl. 200/315, FUNCTION INDICATION MEANS FOR ELECTRIC SWITCHES, Earl T. Piber, Owner of Record: *Cutler-Hammer, Inc., Milwaukee, Wis.,* Attorney or Agent: Hugh R. Rather, et al., Ex. Gp.: 217

3,995,649, Re. S.N. 891,950, Filed Mar. 30, 1978, Cl. 135/4 R, COMPACTIBLE SHELTER, Vincent P. Robichaud, Owner of Record: *Assignor of 6% to Eric A. Robichaud, Westminster, Mass., and 4% to Edward R. Robichaud, Fitchburg, Mass.,* Attorney or Agent: Norman S. Blodgett, Ex. Gp.: 355

4,008,197, Re. S.N. 893,315, Filed Apr. 3, 1978, Cl. 260/31.6, MINERAL OIL EXTENDED POLYURETHANE SYSTEM CONTAINING A COUPLING AGENT FOR DECONTAMINATING AND SEALING THE INTERIOR SPACES OF AN INSULATED ELECTRICAL DEVICE, Melvin Brauer, et al., Owner of Record: *N. L. Industries, Inc., New York, N.Y.,* Attorney or Agent: Platon N. Mandros, Ex. Gp.: 142

4,016,517, Re. S.N. 893,212, Filed Apr. 4, 1978, Cl. 333/71, SIGNAL BANDPASS FILTER APPARATUS, Arun P. Sahasrabudhe, et al., Owner of Record: *Westinghouse Electric Corporation, Pittsburgh, Pa.,* Attorney or Agent: C. F. Renz, et al., Ex. Gp.: 256

4,018,176, Re. S.N. 894,237, Filed Apr. 6, 1978, Cl. 113/1 G, APPARATUS FOR SPIN FLANGING CONTAINERS, Andrew Gnyp, et al., Owner of Record: *Jos. Schlitz Brewing Company, Milwaukee, Wis.,* Attorney or Agent: Elwin A. Andrus, et al., Ex. Gp.: 321

4,019,329, Re. S.N. 894,770, Filed Apr. 10, 1978, Cl. 61/41 A, TRENCH SHORING ASSEMBLY, James L. Griswold, Owner of Record: *Inventor,* Attorney or Agent: Gerald E. McGlynn, Jr., et al., Ex. Gp.: 351

4,021,540, Re. S.N. 865,110, Filed Dec. 27, 1977, Cl. 424/86, METHOD OF DETECTING HEPATITIS ANTIGEN AND ANTIBODIES AND VACCINE FOR HEPATITIS, William Pollack, et al., Owner of Record: *Ortho Diagnostics Inc., Raritan, N.J.,* Attorney or Agent: Ralph T. Lilore et al., Ex. Gp.: 124

4,055,130, Re. S.N. 893,556, Filed Apr. 5, 1978, Cl. 112/58 R, BIGHT STOP MECHANISM FOR SEWING MACHINES, Robert H. Larsen, et al., Owner of Record: *The Singer Company, New York, N.Y.,* Attorney or Agent: Robert E. Smith, et al., Ex. Gp.: 353

PATENT NOTICES

Certificates of Correction for the Week of May 30, 1978

Re.29,176	4,045,587	4,059,492	4,068,768
3,625,078	4,047,801	4,059,585	4,068,830
3,684,019	4,049,345	4,059,632	4,068,970
3,713,803	4,049,578	4,060,538	4,069,065
3,737,997	4,049,617	4,060,546	4,069,090
3,818,258	4,049,627	4,061,364	4,069,118
3,824,204	4,049,779	4,061,612	4,069,187
3,829,484	4,049,819	4,061,729	4,069,554
3,894,034	4,050,814	4,061,864	4,069,858
3,932,064	4,051,124	4,061,866	4,070,147
3,954,732	4,051,222	4,061,967	4,070,355
3,969,722	4,052,155	4,062,288	4,070,472
3,975,064	4,052,352	4,062,502	4,070,497
3,979,545	4,053,198	4,062,697	4,071,148
3,980,688	4,053,323	4,062,715	4,071,270
3,988,322	4,053,394	4,062,771	4,071,328
4,003,675	4,053,599	4,062,826	4,071,423
4,005,997	4,053,637	4,062,905	4,071,657
4,006,443	4,054,139	4,063,169	4,071,811
4,007,443	4,054,327	4,063,229	4,071,827
4,008,181	4,054,479	4,063,715	4,071,894
4,010,715	4,054,483	4,064,045	4,071,975
4,013,629	4,054,559	4,064,187	4,072,005
4,015,662	4,054,651	4,064,194	4,072,245
4,017,091	4,054,667	4,064,199	4,072,619
4,018,837	4,054,767	4,064,396	4,072,725
4,021,148	4,054,885	4,064,410	4,072,826
4,024,506	4,054,946	4,064,447	4,072,924
4,024,631	4,054,992	4,064,478	4,073,000
4,025,575	4,055,204	4,064,521	4,073,507
4,025,622	4,055,227	4,064,855	4,073,605
4,026,009	4,055,285	4,064,956	4,073,708
4,030,802	4,055,578	4,065,800	4,074,036
4,031,271	4,055,702	4,066,311	4,074,243
4,032,536	4,056,411	4,066,436	4,074,441
4,032,607	4,056,554	4,066,770	4,074,914
4,033,268	4,056,557	4,066,815	4,075,149
4,036,136	4,056,717	4,066,836	4,075,519
4,036,330	4,056,807	4,067,313	4,075,524
4,036,850	4,056,864	4,067,841	4,075,730
4,037,138	4,057,016	4,067,853	4,075,836
4,037,793	4,057,372	4,067,886	4,075,878
4,039,187	4,057,428	4,067,907	4,076,059
4,040,670	4,057,508	4,067,999	4,079,027
4,042,550	4,058,519	4,068,220	
4,044,975	4,058,703	4,068,676	
4,045,386	4,059,391	4,068,723	

Disclaimers

3,865,613.—*John Edward Ross*, Stoke Poges, *David James Marshall*, Widmer End, High Wycombe, and *Brian Samuel Chapman*, Prestwood, England. PRESSURE-SENSITIVE COPYING SYSTEMS. Patent dated Feb. 11, 1975. Disclaimer filed Apr. 7, 1978, by the assignee, *Wiggins Teape Research & Development Limited*.

Hereby enters this disclaimer to claims 1, 2 and 5 of said patent.

4,054,226.—*Ronald W. Bjelland*, Valley Stream and *Charles A. Narwicz*, Greenlawn, N.Y., and *Casimir Hetmanski*, Westfield, N.J. LINING OF CONTAINERS FOR BULK CARGO. Patent dated Oct. 18, 1977. Disclaimer filed Dec. 30, 1977, by the assignee, *United States Lines, Inc.*

The term of this patent subsequent to Sept. 14, 1993, has been disclaimed.

Disclaimer and Dedication

3,528,641.—*Rano Joseph Harris, Sr.* and *Joseph Rano Harris, Jr.*, Baton Rouge, La. TUBULAR VALVE. Patent dated Sept. 15, 1970. Disclaimer and dedication filed Feb. 14, 1978, by the inventors.

Hereby disclaim and dedicate to the Public the entire term of said patent.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the Patent Application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF THE AIR FORCE

AF/JACP, 1900 Half St. SW., Washington, D.C. 20324

Patent 4,063,684. Composite Rocket Nozzle Structure. Filed Nov. 25, 1975. Patented Dec. 20, 1977. Not available NTIS.

Patent 4,064,109. Perfluoroalkylene Ether Bibenzoxazole Polymers. Filed July 30, 1976. Patented Dec. 20, 1977. Not available NTIS.

Patent 4,064,422. Weight Multiplier for Use in an Adapter Processor. Filed Aug. 31, 1976. Patented Dec. 20, 1977. Not available NTIS.

Patent 4,064,456. Meter Box Assembly. Filed Apr. 9, 1976. Patented Dec. 20, 1977. Not available NTIS.

U.S. DEPARTMENT OF ENERGY

Assistant General Counsel for Patents
Washington, D.C. 20545

Patent 4,016,784. Tool Setting Device. Filed Jan. 5, 1976. Patented Apr. 12, 1977. Not available NTIS.

Patent 4,017,674. Method for Starting Operation of a Resistance Melter. Filed Jan. 16, 1976. Patented Apr. 12, 1977. Not available NTIS.

Patent 4,017,794. Circuit for Measuring Time Differences Among Events. Filed Sept. 18, 1975. Patented Apr. 12, 1977. Not available NTIS.

Patent 4,026,142. Eddy-Current System for the Vibration Testing of Blades. Filed May 10, 1976. Patented May 31, 1977. Not available NTIS.

Patent 4,029,735. Process for Making Calcium Chromate. Filed Oct. 9, 1975. Patented June 14, 1977. Not available NTIS.

Patent 4,030,557. Well Drilling Apparatus and Method. Filed May 3, 1976. Patented June 21, 1977. Not available NTIS.

Patent 4,031,864. Multiple Fuel Supply System for an Internal Combustion Engine. Filed Mar. 9, 1976. Patented June 28, 1977. Not available NTIS.

Patent 4,032,377. Method for the Production of High-Purity Triaminotrinitrobenzene. Filed July 19, 1976. Patented June 28, 1977. Not available NTIS.

Patent 4,032,873. Flow Directing Means for Air-Cooled Transformers. Filed May 21, 1976. Patented June 28, 1977. Not available NTIS.

Patent 4,037,465. Ultrasonic Probe System for the Bore-Side Inspection of Tubes and Welds Therein. Filed Nov. 19, 1976. Patented July 26, 1977. Not available NTIS.

Patent 4,037,496. Combination Spindle-Drive System for High Precision Machining. Filed Sept. 1, 1976. Patented July 26, 1977. Not Available NTIS.

NATIONAL AERONAUTICS & SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters—NASA
Code GP–2, Washington, D.C. 20546

Patent 4,061,190. In-situ Laser Retorting of Oil Shale. Filed Jan. 28, 1977. Patented Dec. 6, 1977. Not available NTIS.

Patent 4,061,029. Flow Separation Detector. Filed Aug. 6, 1976. Patented Dec. 6, 1977. Not available NTIS.

Patent 4,061,041. Differential Sound Level Meter. Filed Nov. 8, 1976. Patented Dec. 6, 1977. Not available NTIS.

Patent 4,061,146. Tissue Macerating Instrument. Filed Apr. 15, 1976. Patented Dec. 6, 1977. Not available NTIS.

Patent 4,061,427. Laser Extensometer. Filed Oct. 15, 1976. Patented Dec. 6, 1977. Not available NTIS.

Patent 4,061,561. Automatic Multiple-Sample Applicator and Electrophoresis Apparatus. Filed Nov. 24, 1976. Patented Dec. 6, 1977. Not available NTIS.

Patent 4,061,570. Iodine Generator for Reclaimed Water Purification. Filed Apr. 25, 1975. Patented Dec. 6, 1977. Not available NTIS.

Patent 4,061,577. Fiber Optic Multiplex Optical Transmission System. Filed Aug. 18, 1976. Patented Dec. 6, 1977. Not available NTIS.

Patent 4,061,579. Intumescent Coatings Containing 4,4'-Dinitrosulfanilide. Filed Oct. 22, 1976. Patented Dec. 6, 1977. Not available NTIS.

Patent 4,061,834. Durable Antistatic Coating for Polymethylmethacrylate. Filed June 3, 1976. Patented Dec. 6, 1977. Not available NTIS.

Patent 4,061,955. Multi-Cell Battery Protection System. Filed May 19, 1976. Patented Dec. 6, 1977. Not available NTIS.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MAY 6, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-3-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-20-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	8-1-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	5-25-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-2-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	2-2-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	12-30-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	3-9-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	9-21-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-27-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	6-24-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-7-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	7-26-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	3-7-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GRAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	3-21-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	6-13-77

Expiration of patents: The patents within the range of numbers indicated below expire during May 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,981,954 to 2,986,736, inclusive
Plant Patents..... Numbers 2,055 to 2,066, inclusive

REISSUES

MAY 30, 1978

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,643

LOCKING BARS

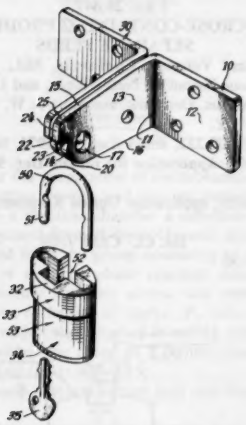
Daniel Victor Berry, Bracknell, and Stanley Gerald Thomas Knott, Wadhurst, both of England, assignors to Ingersoll Locks, Limited, England

Original No. 3,638,460, dated Feb. 1, 1972, Ser. No. 95,257, Jan. 5, 1971. Continuation of Ser. No. 73, Feb. 2, 1970, abandoned. Application for reissue Dec. 26, 1974, Ser. No. 536,470

The portion of the term of this patent subsequent to Mar. 23, 1988, has been disclaimed.

Int. Cl.[2] **E05B** *67/02, 67/22*

U.S. Cl. 70—52 **2 Claims**



8. An improved padlock construction for securing perforated locking bars, said padlock construction comprising a U-shaped shackle and a padlock body, said padlock body including a first end portion having an end surface thereof arranged for the introduction of the U-shaped shackle therewithin, a second end portion including a locking mechanism, extending internally thereof and actuatable from an end surface of said second end portion, for releasable interengagement with the shackle to maintain said shackle in a locking position, said body further including a cruciform depression extending inwardly from the end surface of said first end portion towards said second end portion, the side walls of said padlock body closing the ends of three arms of said cruciform depression and the fourth arm of said cruciform depression being open on one side of the padlock body, the first and second closed arms of the cruciform depression receiving the legs of the U-shaped shackle and substantially completely accommodating the U-shaped shackle when the shackle is in said locking position, and the third closed arm of the cruciform depression and the fourth open arm of the cruciform depression receiving the perforated locking bars to be secured together by the shackle of the padlock so that, in use, the perforated locking bars project through the side wall of the padlock and extent into the third and fourth arms of the cruciform depression.

Re. 29,644

BAG FORMING MACHINES

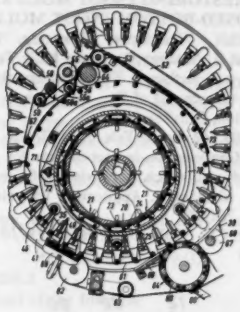
Arthur William Simpson, Hemel Hempstead, and Frank William Pocock, East Harptree, both of England, assignors to Simon-VK Limited, Wirral, England

Original No. 3,867,873, dated Feb. 25, 1975, Ser. No. 410,415, Oct. 29, 1973. Application for reissue Mar. 22, 1977, Ser. No. 780,185

Claims priority, application United Kingdom, Oct. 27, 1972, 49536/72; July 12, 1973, 33342/73

Int. Cl.[2] **B31B** *1/64*

U.S. Cl. 93—33 H **4 Claims**



1. Apparatus for forming individual heat sealed articles, e.g. tubes or bags, from a strip of two superimposed layers of heat sealable material or of a material coated, or impregnated, with heat sealable material, said apparatus comprising:

a welding device comprising a continuous surface of heat transmitting material;

means to heat said surface; [and]

means for feeding a strip of material in a zig-zag configuration along a path which extends along at least a part of said continuous surface, said feeding means comprising members supporting said strip at the transverse crests located on both sides of the zig-zag to present the crests on one side of said zig-zag to said continuous surface; *and*

said continuous surface being cylindrical and being mounted for rotation when engaged by the moving strip.

Re. 29,645

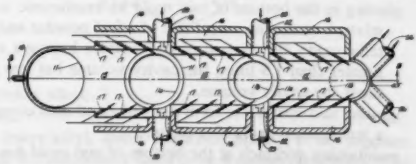
PRODUCT TRANSFER SYSTEM

Elton G. Kaminski, Sidney, Ohio, assignor to The Stolle Corporation, Sidney, Ohio

Original No. 3,941,070, dated Mar. 2, 1976, Ser. No. 566,294, Apr. 9, 1975. Application for reissue June 16, 1977, Ser. No. 807,193

Int. Cl.[2] **B21D** *43/18*

U.S. Cl. 113—7 A **12 Claims**



1. In an apparatus for manufacturing articles, such as two-

piece can bodies, wherein a series of operations are performed on said articles at a first station, at least one intermediate station and a final station, a dimension of said article being reduced at said intermediate station; a channel connecting said stations, said channel at said intermediate station having fixed stop means of a dimension to prevent passage thereby of an article prior to the operation to be performed at such intermediate station, but to permit passage thereby after the operation at said intermediate station has been performed, and means for advancing the articles from station to station after each operation [.], *said stop means being configured to fit snugly the portion of the article bearing against it prior to the operation to be performed at said station, and vacuum means associated with said stop means to assure that the article is properly positioned and held in place for said operation.*

Re. 29,646

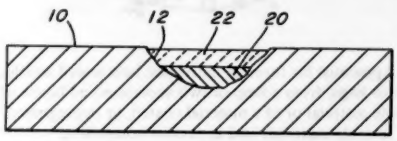
METHOD OR RESTORING INGOT MOLD STOOLS AND CLOSED-BOTTOM INGOT MOLD

Robert H. Kachik, Washington Township, Westmoreland County; Samuel J. Manganello, Penn Hills Township, Allegheny County, and Arthur J. Pignocco, Franklin Township, Westmoreland County, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Original No. 4,005,742, dated Feb. 1, 1977, Ser. No. 664,793, Mar. 8, 1976. Continuation-in-part of Ser. No. 517,991, Oct. 25, 1974, abandoned, which is a division of Ser. No. 332,870, Feb. 15, 1973, abandoned. Application for reissue Mar. 25, 1977, Ser. No. 781,252

Int. Cl.[2] B23K *23/00*; B22D *19/10*

U.S. Cl. 164—54 **19 Claims**



1. A method of repairing an erosion cavity in ingot mold stools and the bottoms of closed-bottom metal molds *and other large castings* comprising:

placing in said cavity an exothermic reaction mixture consisting essentially of a fuel powder and a metallic oxide, the amount of said mixture having a volume no greater than one and a half times the volume of the cavity;

igniting said mixture to form a superheated melt comprising a metal phase and a slag phase, such that said melt is contained entirely within said cavity,

maintaining said melt in said cavity for a time sufficient to allow said melt to separate so that said metal phase is at the bottom and the slag phase thereover,

permitting said melt to solidify with the metal phase securely bonded to the bottom of the cavity and said slag phase securely attached to said metal phase, and permitting said slag phase to remain in said erosion cavity during subsequent use of said mold or mold stool to thereby provide extra protection from erosion and extend the life of the repaired stool or mold.

12. A method of repairing an erosion cavity in the bottom of a closed-bottom ingot mold comprising:

placing in the bottom of said mold an exothermic reaction mixture consisting essentially of a fuel powder and a metallic oxide, the amount of said mixture having a volume greater than 1.5 times the cavity volume but less than 5 times the cavity volume,

igniting said mixture to form a superheated melt comprising a metal phase and a slag phase,

maintaining said melt at the bottom of said mold for a time sufficient to allow said melt to separate into a metal phase and a slag phase, said metal phase separating to the bottom and being entirely contained within said cavity, while said slag phase covers the entire bottom of the mold,

permitting said melt to solidify with the metal phase securely bonded to the bottom of the cavity and said slag phase securely attached to the metal phase to provide a slag surface over the entire bottom of the mold, and permitting said slag phase to remain in on said mold bottom during subsequent use of said mold to thereby provide extra protection from erosion and extend the life of the repaired mold.

Re. 29,647

DRIED SUCROSE-CONTAINING PRODUCTS FROM SEPARATE FEEDS

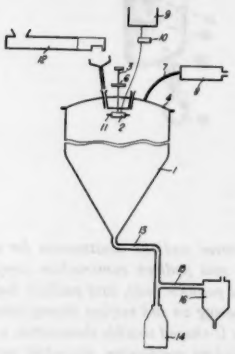
Preston Leonard Veltman, Clarksville, Md.; Johannes C. J. Verdonk, Zoog Zaandijk, Netherlands, and Lars Olav Thomsen, Viby, Aarlus, Denmark, assignors to W. R. Grace & Co., New York, N.Y.

Original No. 3,600,222, dated Aug. 17, 1971, Ser. No. 879,668, Nov. 25, 1969. Application for reissue Dec. 9, 1976, Ser. No. 749,115

Claims priority, application United Kingdom, Nov. 26, 1968, 56144/68

Int. Cl.[2] C13F *1/02*

U.S. Cl. 127—30 **10 Claims**



1. A process for preparing solid sugars which comprises

(a) dispersing in a current of heated *drying* air *in a spray dryer* separate feeds of *atomized* sucrose solution and of *solid* fine sucrose particles [;], *in a weight ratio of solid fine sucrose particles to the solids in said sucrose solution in the range of about 1 to about 4;*

(b) evaporating the water from the sugar solution coated on the *sucrose* particles [,];

[(c) recovering the coated particles from said air stream, and]

[(d)] *(c)* maintaining the outlet [air] temperature *of the heated drying air from the spray dryer* within the range of 45–105° C.;

(d) recovering the coated particles from said outlet air stream; and

(e) recycling the said recovered particles from step (d) as the solid fine sucrose particles in step (a).

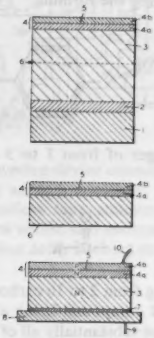
Re. 29,648
PROCESS FOR THE PREPARATION OF ELECTROLUMINESCENT III-V MATERIALS CONTAINING ISOELECTRONIC IMPURITIES

Warren O. Groves, DesPeres; Arno H. Herzog, and Magnus G. Craford, both of St. Louis, all of Mo., assignors to Monsanto, St. Louis, Mo.

Original No. 3,873,382, dated Mar. 25, 1975, Ser. No. 313,313, Dec. 8, 1972. Division of Ser. No. 158,312, June 30, 1971, Pat. No. 3,725,749. Application for reissue Mar. 7, 1977, Ser. No. 775,069

Int. Cl.[2] **H10L** *21/205;* **H01L** *29/207*

U.S. Cl. 148—175 **6 Claims**



1. A process for the preparation of electroluminescent materials for light-emitting diodes, said process comprising:

a. providing in a reaction chamber a substrate of a single-crystal compound formed from Ga and one of the elements selected from the group consisting of As and P;

b. combining in a vapor phase reactant stream reactant material including impurity atoms, said materials being adapted for the formation of $GaAs_{1-x}P_x$, wherein x has an initial value within the range of from 0–1 inclusive and a final value within the range of [greater than 0.2 to less than 1.0] *about 0.4 to about 0.9;*

c. introducing said reactant stream into said reactant chamber;

d. epitaxially depositing on said substrate from said stream said reactant materials to form a first epitaxial layer of a first electrical conductivity type on said substrate, said layer constituting a bulk region substantially free of isoelectronic impurities;

e. introducing into said stream an isoelectronic impurity in vapor form;

f. epitaxially depositing on said substrate from said stream said reactant materials to form a second epitaxial layer of said first conductivity type on said first epitaxial layer, said second epitaxial layer providing a surface region containing said isoelectronic impurity atoms; and

g. forming a junction in said surface region by introducing electronic impurity atoms of an electronic conductivity type opposite to that of said first conductivity type.

Re. 29,649
CLEANING COMPOSITION

Albert M. Farnsworth, 616 N. Arizona Ave., Chandler, Ariz. 85224

Original No. 3,933,674, dated Jan. 20, 1976, Ser. No. 547,786, Feb. 7, 1975. Application for reissue Nov. 18, 1976, Ser. No. 742,992

Int. Cl.[2] **C11D** *3/43, 3/44, 3/46, 7/50*

U.S. Cl. 252—171 **10 Claims**

10. A composition for removing contaminating resinous, gummy or tarry residues from surfaces without adversely affecting paints or varnishes, said composition being substantially non-irritating to the skin and eyes of human beings, which comprises, in combination, the following ingredients in weight proportions, as indicated, based on the weight of the whole composition:

A. about 60 to 80% of a base hydrocarbon oil of substantially the boiling range of kerosene, which is substantially free of objectionable odor and having not more than 5% of sulfonatable constituents;

B. about 20 to 35% of a limonene type citrus distillate having high solvency for the contaminant and having a refractive index between about 1.4718 and 1.4722 at 20° C., with a specific gravity between about 0.838 and 0.843, having a resin content not more than about 0.10% and aldehyde content not in excess of about 0.90%

C. about 2.0 to 3.5% of a skin lubricant; and

about 0.5 to 3% of a surface active agent to promote wetting of the contaminant by the composition.

Re. 29,650
PHTHALIDE PENICILLIN ESTER INTERMEDIATES

Harry Ferres, Horsham, England, assignor to Beecham Group Limited, Great Britain

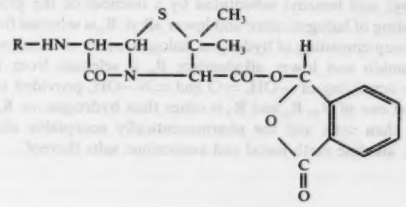
Original No. 3,963,702, dated June 15, 1976, Ser. No. 447,672, Mar. 4, 1974. Division of Ser. No. 259,560, June 5, 1972, Pat. No. 3,860,579. Application for reissue Aug. 18, 1977, Ser. No. 779,076

Claims priority, application United Kingdom, June 9, 1971, 19604/71

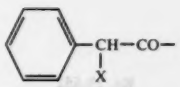
Int. Cl.[2] **C07D** *499/32*

U.S. Cl. 260—239.1 **2 Claims**

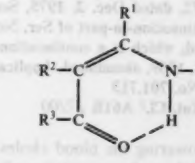
1. A compound of the formula:



wherein R is a hydrogen or



in which X is [NH_3^+] benzyloxycarbonylamino, N_3 or an enamine of the formula:



wherein

R^1 is lower alkyl,

R^2 is H,

R^3 is lower alkyl, lower alkoxy or phenyl, or R^2 together with R^1 completes a fused 5- or 6 membered carbocyclic ring.

Re. 29,651

DERIVATIVES OF ANTIBIOTIC X-537A

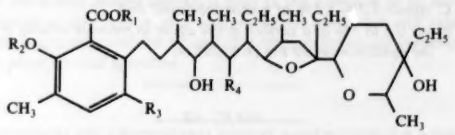
Arthur Stempel, Teaneck, and John Westley, Cedar Grove, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Original No. 3,715,372, dated Feb. 6, 1973, Ser. No. 851,044, Aug. 18, 1969. Application for reissue Dec. 28, 1976, Ser. No. 755,099

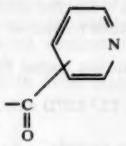
Int. Cl.[2] C07D *309/22;* A61K *31/35*

U.S. Cl. 260—345.7 R 13 Claims

1. A compound selected from the group of compounds of the formula



wherein R_1 is selected from the group consisting of hydrogen, [lower alkyl], phenyl, and phenyl substituted by a member of the group consisting of halogen, nitro and lower alkyl; R_2 is selected from the group consisting of hydrogen, lower alkyl, lower alkanoyl,



benzoyl, and benzoyl substituted by a member of the group consisting of halogen, nitro and lower alkyl; R_3 is selected from the group consisting of hydrogen, halogen, nitro, amino, lower alkylamido and lower alkylamino; R_4 is selected from the group consisting of —OH, =O and =N—OH, provided that at least one of R_1, R_2 and R_3 is other than hydrogen, or R_4 is other than =O; and the pharmaceutically acceptable alkali metal, alkaline earth metal and ammonium salts thereof.

Re. 29,652

METHOD OF LOWERING BLOOD CHOLESTEROL LEVEL

Joseph E. Fields, and John H. Johnson, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Original No. 3,923,972, dated Dec. 2, 1975, Ser. No. 353,832, Apr. 23, 1973. Continuation-in-part of Ser. No. 188,577, Oct. 12, 1971, abandoned, which is a continuation-in-part of Ser. No. 789,081, Jan. 2, 1969, abandoned. Application for reissue July 1, 1976, Ser. No. 701,713

Int. Cl.[2] A61K *27/00*

U.S. Cl. 424—78 8 Claims

1. A method for lowering the blood cholesterol level in a living animal in need thereof comprising orally administering to said animal an effective blood cholesterol lowering amount of a copolymer of (1) an alpha alkene of [about 8] *10* to about 22 carbon atoms and (2) maleic acid or anhydride, or a pharmaceutically acceptable amide, ester, imide, salt thereof or mixtures thereof, said copolymer having a molecular weight in the range of from about 1000 to 1,000,000.

Re. 29,653

METHOD FOR PROTECTING HUMAN SKIN FROM ULTRAVIOLET RADIATION

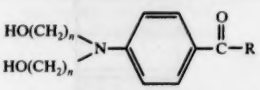
Paul L. Warner, Jr., Clarence, N.Y., assignor to Westwood Pharmaceuticals, Inc., Buffalo, N.Y.

Original No. 3,953,589, dated Apr. 27, 1976, Ser. No. 509,997, Sept. 27, 1974. Continuation of Ser. No. 351,398, April 16, 1973, abandoned. Application for reissue Aug. 16, 1976, Ser. No. 714,870

Int. Cl.[2] A61K *7/44*

U.S. Cl. 424—60 9 Claims

1. A method for protecting human skin from the erythemic effect of ultraviolet radiation which comprises applying to the skin a compound having the formula



wherein n is an integer of from 1 to 3 and [R is an alkyl group]

is an acyl group having from 2 to 16 carbon atoms *derived from an alkanoic acid,* said compound being applied in an amount sufficient to screen out substantially all of the radiation having a wave length between about 297 nm and 320 nm.

Re. 29,654

PREPARATION OF HYDROCARBON RESINS USING ZIRCONIUM TETRACHLORIDE

Kenneth C. Petersen, Scotia, and Royal A. Meader, Jr., Ballston Spa, both of N.Y., assignors to Schenectady Chemicals, Inc., Schenectady, N.Y.

Original No. 3,919,181, dated Nov. 11, 1975, Ser. No. 405,455, Oct. 11, 1973. Application for reissue Aug. 16, 1977, Ser. No. 825,051

Int. Cl.[2] C08F *4/16*

U.S. Cl. 526—90 25 Claims

35. A process of preparing a light colored aromatic vinyl resin comprising polymerizing a member of the group consisting of (1) as the sole monomer styrene, alpha-methyl styrene or p-t-butyl styrene; (2) a mixture of (a) styrene and (b) alpha-methyl styrene; or (3) a mixture of (a) styrene, (b) alpha-methyl styrene and (c) as a third monomer a member of the group consisting of limonene, p-t-butyl styrene and vinyl toluene, and (4) a mixture of (a) styrene, (b) alpha-methyl styrene, (c) limonene and (d) p-t-butyl strene, in the presence of a catalyst consisting essentially of zirconium tetrachloride in an amount of 0.1 to 8% of the total monomer.

36. A process of preparing a light colored aromatic vinyl resin comprising polymerizing a member of the group consisting of (1) as the sole monomer styrene, alpha-methyl styrene or p-t-butyl styrene; (2) a mixture of (a) styrene and (b) alpha-methyl styrene; or (3) a mixture of 5 to 50% of (a) styrene, 5 to 80% of (b) alpha-methyl styrene, and 5 to 50% of (c) as a third monomer a member of the group consisting of limonene, alpha-pinene, beta pinene, dipentene, p-t-butyl styrene and vinyl toluene; or (4) a mixture of (a) styrene, (b) alpha-methyl styrene, (c) limonene and (d) p-t-butyl styrene, in the presence of a catalyst consisting essentially of zirconium tetrachloride in an amount of 0.1 to 8% of the total monomer.

Re. 29,655

TELEPHONE ANSWERING DEVICE

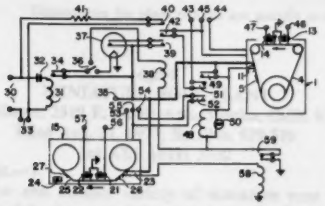
Leonard M. Todd, 424 W. 119th St., New York, N.Y. 10027

Original No. 3,445,600, dated May 20, 1969, Ser. No. 388,091, Aug. 7, 1964. Continuation of Ser. No. 54,670, July 13, 1970, abandoned. Application for reissue June 10, 1975, Ser. No. 585,694

Int. Cl.[2] H04M *1/64*

U.S. Cl. 179—6 R

29 Claims



1. A telephone answering device connected to the telephone line for reproducing an announcement and recording messages, comprising endless tape announcement reproducing means, an endless tape within said endless tape announcement reproducing means, time delay latching means actuated by ring up current in said telephone line causing line seizure and starting said endless tape announcement reproducing means, a first impulse generating element on said endless tape located at the conclusion of said announcement, a first impulse sensitive element adjacent said endless tape, message recording means, a message recording tape within said message recording means, a plurality of second impulse generating elements on said message recording tape spaced along said tape at the conclusion of each predetermined message interval, a second impulse sensitive element adjacent said message recording tape, second latching switching means actuated by the passage of said first impulse generating element across said first impulse sensitive element, latching said second latching switching means, stopping said endless tape announcement reproducing means and starting said message recording means, disconnect switching means actuated by the passage of *one of* said plurality of second impulse generating elements across said second impulse sensitive element, unlatching said time delay latching means which releases line seizure and unlatching said second latching switching means, thereby stopping said message recording means and readying said answering device for the next call, manually operated switching means, rewind means and playback means for playing back said recorded messages and means for recording and checking said announcement.

PLANT PATENTS

GRANTED MAY 30, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,254

MINIATURE ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277

Filed Aug. 31, 1977, Ser. No. 829,510
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, rounded, much branched habit substantially as illustrated and described, characterized by (1) well mossed buds and (2) by buds and flowers of rich orange to orange pink color, the buds and flowers resembling Golden Angel (miniature — U.S. Plant Pat. No. 4,028) in size and shape; and further characterized by a plant which is vigorous and compact, with all shoots and branches quite thorny, the said plant being easy to propagate from cuttings or by budding, with an abundance of small to medium size semi-glossy foliage and an abundance of flowers borne singly or several to the stem in loose clusters.

4,255

CREPE MYRTLE

David Earl Chopin, Baton Rouge, La., assignor to Chopin & Wright Nursery, Ltd., Baton Rouge, La.

Division of Ser. No. 742,378, Nov. 16, 1976, abandoned. This application Apr. 8, 1977, Ser. No. 781,198
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—54 **1 Claim**

1. A new distinct variety of *Lagerstroemia indica* plant substantially as shown and described, characterized by the distinctive Rose-Purple color, its height up to 9 to 20 inches, substantially no vertical growth at full maturity, and a weeping growth habit at full maturity.

4,256

CREPE MYRTLE

David Earl Chopin, Baton Rouge, La., assignor to Chopin & Wright Nursery, Ltd., Baton Rouge, La.

Division of Ser. No. 742,378, Nov. 16, 1976, abandoned. This application Mar. 25, 1977, Ser. No. 781,514
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—54 **1 Claim**

1. A new distinct variety of *Lagerstroemia indica* plant substantially as shown and described, characterized by the distinctive Violet-Purple color, its height up to 9 to 20 inches, substantially no vertical growth at full maturity, and a weeping growth habit at full maturity.

4,257

PLANT OF THE FERN FAMILY

Howard G. McAllister, 1100 NW. 75th Ave., Plantation, Fla. 33303

Filed May 9, 1977, Ser. No. 795,394
Int. Cl.[2] A01H *9/00*
U.S. Cl. Plt.—88 **1 Claim**

1. The new and distinct plant variety of the fern family substantially as herein described and illustrated and characterized by a growth habit which provides specimens that have compound bipinnate fronds that grow in a compact rosette arrangement with a noticeable absence of sori, and which, in comparison to specimens of the parent variety, exhibit a more delicate texture that may be attributed to generally longer pinnae with pinnule margins that exhibit a predominance of pinnately lobed to pinnately divided lobing.

PLANT PATENTS

GRANTED MAY 28, 1974

PATENTS

GRANTED MAY 30, 1978

ERRATA

For CLASS	See PATENT NO.
407–001	4,091,525
062–029	4,091,633
162–025	4,091,749
081–057.39	4,091,890
400–124	4,091,909
400–131	4,091,910
400–070	4,091,911
400–146	4,091,912
400–124	4,091,913
400–196.1	4,091,914
366–165	4,092,013
366–156	4,092,014
366–081	4,092,015
297–440	4,092,049
298–018	4,092,050
298–024	4,092,051
299–002	4,092,052
062–003	4,092,138
134–186	4,092,176
544–224	4,092,311
544–243	4,092,312
544–313	4,092,313
544–277	4,092,314
544–291	4,092,315
544–351	4,092,316
210–142	4,092,338
568–824	4,092,366
568–785	4,092,367
568–877	4,092,368
423–607	4,092,439
235–088 RC	4,092,521
235–308	4,092,522
235–310	4,092,523
235–419	4,092,524
235–463	4,092,525
235–487	4,092,526
364–709	4,092,527
362–427	4,092,528
330–297	4,092,701
354–015	4,092,702
357–038	4,092,703

PATENTS

GRANTED MAY 30, 1978

GENERAL AND MECHANICAL

4,091,464
SPACESUIT MOBILITY JOINTS

Hubert C. Vykukal, Los Altos, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 23, 1976, Ser. No. 753,965
Int. Cl.[2] A62B *17/00*
U.S. Cl. 2—2.1 A **33 Claims**

1. In a constant volume mobility joint assembly particularly suited for interconnecting adjacent segments of an hermetically sealed pressure suit for relative motion, an annulated joint comprising:

A. a pair of axially spaced, rigidly configured annuli including a first annulus supported for pivotal displacement about a first axis paralleling the diameter thereof and a second annulus arranged in axially spaced relation with said first pivotal axis and supported for pivotal displacement about a second pivotal axis arranged in spaced parallelism with said first axis;

B. restraint means extended between the annuli and connected thereto for maintaining the pivotal axes in a substantially fixed spatial relationship;

C. a flexible, substantially impermeable diaphragm of a tubular configuration spanning the distance between the annuli and connected thereto in an hermetically sealed relationship therewith characterized by a length dimension greater than the distance between the pivotal axes and having defined therein at least one rolling convolution having a crown disposed in a fixed relationship with at least one annulus; and

D. means connected with said diaphragm for maintaining a coincident relation between said crown and the pivotal axis of said one annulus as pivotal displacement is imparted to the annuli of said pair.

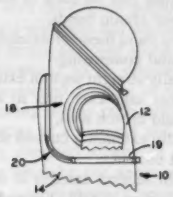
4,091,465
SPACESUIT TORSO CLOSURE

Bruce W. Webbon, San Jose, and Hubert C. Vykukal, Los Altos, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 23, 1977, Ser. No. 780,569
Int. Cl.[2] B63C *11/04*
U.S. Cl. 2—2.1 A **8 Claims**

1. A separable closure assembly joining a pair of coaxially aligned, axially separable, tubular segments of a pressure suit along a zone of separation having a first portion disposed in a plane projected transversely with respect to the longitudinal axis of the suit beneath the shoulder zone thereof, a second portion disposed in a plane projected behind said shoulder zone in substantial parallelism with the plane of said axis comprising:

A. a first endless member concentrically related to the suit and affixed to one segment thereof characterized by a first endless sealing surface of a transversely angulated cofiguration,



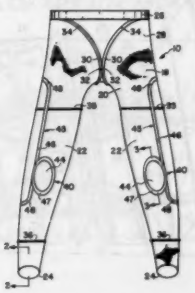
B. a second endless member concentrically related to the suit and affixed to the other segment thereof characterized by a second endless sealing surface of a transversely angulated configuration mated in contiguous relation with the first endless surface; and

C. means releasably securing said surfaces in contiguous relation including a radially expansible "C" section clamp disposed in an engaged relationship with said endless members.

4,091,466
HOCKEY GARMENT

Ronald Kearn, 146 N. Bonningten Ave., Scarborough, Ontario, Canada (M1K 1Y1)

Filed Jan. 5, 1977, Ser. No. 756,806
Int. Cl.[2] A41D *13/00*
U.S. Cl. 2—23 **2 Claims**



1. A unitary hockey garment formed of material comprising:

a. a body portion adapted to be snugly worn about the lower trunk area of the body and conforming to the contours thereof,

b. an integral crotch area associated with said body portion,

c. a pair of legs integrally connected to said body portion, each said leg adapted to surround one leg of the wearer,

d. a foot portion connected to each of said leg portions adapted to surround the foot of the wearer,

e. said foot portion including an inner sock beneath said material of the garment.

f. a waist elastic band connected to said body portion at the upper end thereof,

g. crotch elastic bands secured along their length to said body portion and extending from said crotch area to said waist elastic band,

h. said crotch elastic bands are joined to each other intermediate the ends thereof adjacent said crotch area, and extending upwardly therefrom and secured to said waist elastic band,

i. an upper leg elastic band extending circumferentially and horizontally on each of said legs adjacent said crotch area,

j. a lower leg elastic band extending circumferentially and horizontally on each of said legs adjacent said foot portion,

k. a protective knee pad on each of said legs between said upper and lower elastic bands,

l. a vertical elastic band member extending on the outside of each said leg and comprising:

(1) a substantially straight section extending from immediately adjacent said knee pad to a point substantially even with said crotch area,

(2) an outwardly extending curved section at each end of said straight section,

(3) said straight section extends in overlapping relationship with a portion of said knee pad on each of said legs, and

(4) said straight section crosses said upper elastic band, and

m. said elastic bands being positioned in such a manner to provide the garment with the necessary support and concurrently maintain the garment in gripping relationship to the body surface of the wearer.

4,091,467

METHOD OF MAKING CAPS ON A CONTINUOUS PRODUCTION LINE AND CAPS OBTAINED THEREBY

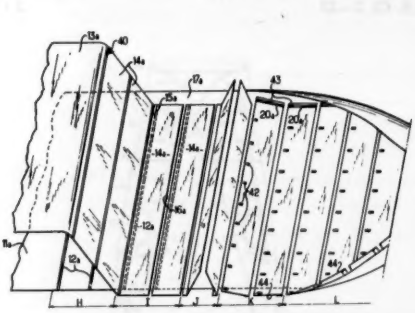
Robert Zuccaro, Lyons, and Pierre Lory, La Duchere Lyon, both of France, assignors to Plymatic, Villeurbanne, France

Filed Jul. 7, 1976, Ser. No. 703,252

Claims priority, application France, Jul. 9, 1975, 75 21544

Int. Cl.[2] A42C *1/00*; A42B *1/04*

U.S. Cl. 2—192 **27 Claims**



1. A method of making on a continuous production line basis caps and like headgears, wherein the improvement comprises the steps of:

causing a first web to continuously move in a running direction of travel;

laying and securing transversely to the width of said first web in substantially regularly spaced relationship onto said first web portions of a second travelling web, each portion constituting a separate element to be ultimately cut off said second web so as to define rectangular elements adapted to form the crown portions of said headgears, the fastening of each rectangular element being carried out along a line extending in at least approximately transverse relation to said running direction of travel, along a first edge of said rectangular element;

forming a flat tube, optionally provided with longitudinal folds, from said first web carrying said rectangular elements, assembling together the other edges of each one of said rectangular elements, both edges of said element parallel to said running direction of travel being connected to each other and the second edge of said element parallel to said first edge of said element along which is effected said fastening being assembled with itself;

securing together both opposite longitudinal edges of said first web in regularly spaced relationship; and

finally cutting said flat tube at substantially regular spacings so as to sever completed individual of said headgears therefrom.

4,091,468

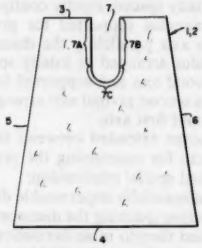
SKIRT AND METHODS OF MAKING THE SAME

Dickson Tak Sun Wong, 71-75, Chai Wan Kok Street, Victory Factory Building, 2nd Floor, Tsuen Wan, New Territories, Lowloon, and Quen Ling Liu, 679 Nathan Road, 3rd Floor, Block A, Kowloon, both of Hong Kong

Filed Jan. 12, 1977, Ser. No. 758,726

Int. Cl.[2] A41D *1/14*

U.S. Cl. 2—212 **4 Claims**



1. A lower garment made up of a front panel and a rear panel and comprising an upper part extending downwardly from a waist region of the garment to a crotch region thereof, at which the front panel is secured to the rear panel, whereby said upper part is constructed as a pant, and a lower part extending downwardly from said crotch region in the form of a skirt having a single, continuous lower boundary.

4,091,469

HEAD PROTECTOR FOR USE WITH HARD HEAD GEAR

Jacob Davidson, The Philadelphian, Apt. 6A10, 2401 Pennsylvania Ave., Philadelphia, Pa. 19130

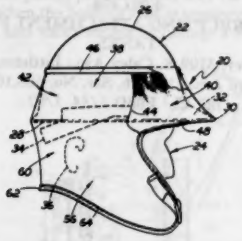
Filed Dec. 28, 1976, Ser. No. 755,106

Int. Cl.[2] A42B *1/06*

U.S. Cl. 2—410 **5 Claims**

1. For use in combination with hard head gear including a crowned portion terminating in a free edge which forms a brim in the front thereof, weather-protective covering which is placed on the head gear or removed therefrom while the head gear is worn and comprising a flexible tubular portion includ-

ing a front panel formed of an elastic material and a rear panel formed of an inelastic, outer layer of a waterproof Nylon and a liner of a thermally insulative material, said tubular portion also including an elastic opening at the top formed by a band of elastic material, said tubular portion being adapted to be disposed over said head gear while said head gear is worn, with the crown extending through the elastic opening and with the elastic front panel of the covering disposed over and accommodating the brim, said rear panel also comprising a pair of flaps extending downward and forwardly from the tubular portion on opposite sides thereof and being joined at the rear thereof by a web portion, each of said flaps terminating in a



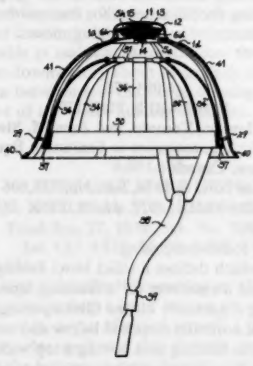
relatively narrow free end and including readily disconnectable connection means at their free ends to enable the flaps to be connected together adjacent the wearer's chin, whereby the flaps and the connecting web cover the sides of the wearer's face and the back of the wearer's head and neck, said flaps and interconnecting web being sufficiently flexible to enable the flaps and web to be bent upward with the flaps outside of said head gear and with their free ends bent downward and inserted between the elastic band and the crown portion of the head gear to hold the flaps outside the head gear and thereby expose the sides of the wearer's face and the back of the wearer's head and neck.

4,091,470

COLLAPSIBLE HELMET

Takemi Ryunoshin, No. 3233-114, Haraichi, Ageo-shi, Saitama-ken, Japan

Filed Feb. 2, 1977, Ser. No. 764,955
Claims priority, application Japan, Dec. 29, 1976, 51-158746
Int. Cl.[2] A42B *1/06*
U.S. Cl. 2—410 **9 Claims**



1. A collapsible helmet adapted to fold between a collapsed nested position and an unfolded developed position comprising a plurality of fan-shaped segments having a circular plate connected to the upper end of each of said segments which are adapted to be superposed one on the other, each of said plates having an aligned aperture therein, a pivot means for pivotally connecting said plates in superposed relationship wherein said segments can pivot between a nested position and developed position, said pivot means comprising a sleeve extending through said aligned apertures, a spring disposed in said sleeve, a cap member disposed over said stacked circular plates, said spring having one end thereof secured to said cap member, an adjusting member extending into said sleeve, said spring having its other end adustably secured to said adjusting member whereby the tension of said spring can be adusted, means for successively training said segments upon unfolding from the nested position, said training means comprises a cut-out portion formed about a peripheral portion of plates, and a complementary claw member, said cut-out portion and complementary claw member being arranged whereby the claw member of one plate engages with the cut-out portion of the next adjacent plate, each of said segments having complementary first and second fastening means disposed along the opposed edge portion which are arranged to be disposed in overlapping relationship in the developed position of said segments, said first and second fastening means each comprises an aperture disposed along one edge of a segment and a complementary projection oppositely disposed along the other longitudinal edge of said segment whereby the aperture of one segmet is adapted to receive a complementary projection of the next adjacent segment in the unfolded position of said segment, and its complementary projection and aperture of said second fastening means being relatively moveable to one another to and having complementary latching means to provide an interlock therebetween,

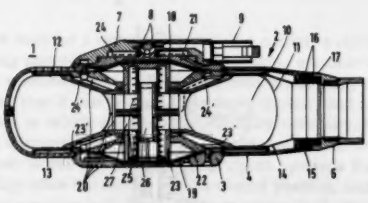
said first fastening means being aperture to restrict circumferential displacement of said segments relative to one another, and said second fastening means being operative to restrict outward displacement of the adjacent segments in the developed position of said helment.

4,091,471

PUMP FOR AN ARTIFICIAL HEART

Christian Richter, Unterhaching, Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Filed Dec. 13, 1976, Ser. No. 750,182
Claims priority, application Germany, Dec. 19, 1975, 2557475
Int. Cl.[2] A61F *1/24;* A61M *1/03*
U.S. Cl. 3—1.7 **16 Claims**

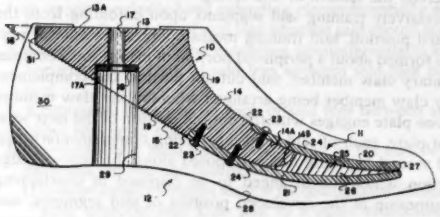


1. A pump for an artificial heart pump, said pump housing having polar regions and an equatorial region, said polar regions comprising central housing means made of substantially rigid material, said equatorial region comprising a peripheral housing member made of flexible material, said central housing means and said peripheral housing member confining a hollow space, said pump housing further comprising inlet and outlet port means operatively secured to said peripheral housing member to extend tangentially relative to said equatorial region, connector means, and means rotatably securing said connector means to said central housing means on at least one side of said pump housing.

4,091,472
PROSTHETIC FOOT

Reinhard L. Daher, R.R. #1, Dugald, Canada (R0E0K0), and Frederick Robert Tucker, 138 Buxton Road, Winnipeg,, Canada (R3T0G9)

Filed Dec. 27, 1976, Ser. No. 754,501
Int. Cl.[2] A61F *1/08*
U.S. Cl. 3—7 **16 Claims**

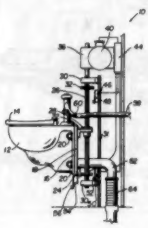


1. A prosthetic foot comprising in combination a substantially rigid keel, said keel including a substantially flat upper attachment portion, a concavely curved instep portion, a nose portion, and a diminished heel portion, a toe assembly secured to and extending forwardly from the front ends of the instep portion and the diminished heel portion and enclosing said nose portion, and a one-piece, flexible foam, foot-shaped body with smooth exterior skin surrounding and enveloping said keel and said toe assembly, said toe assembly including upper and lower flexible plate members secured by one end thereof to said front ends and extending forwardly therefrom and converging together at the distal ends thereof to define a wedge shaped cavity therebetween, a foam insert moulded within said cavity thereby providing the necessary resistance to dorsiflexion of the foot when in use, the durometer reading of said foam insert being greater than the durometer reading of the said body.

4,091,473
ADJUSTABLE TOILET

William C. Matthews, and Eunice C. Matthews, both of 322 Rutland, Wichita, Kans. 67208

Filed Nov. 17, 1976, Ser. No. 742,599
Int. Cl.[2] E03D *11/00, 11/14*
U.S. Cl. 4—420 **4 Claims**



1. An adjustable toilet, for mounting on a vertical wall the toilet comprising:

a wall mounted toilet bowl having a verical base said bowl having a supply line and a discharge line;

a mounting bracket attached to said base;

a flexible waste pipe line attached to the discharge line of said toilet bowl;

a flexible water supply line attached to the supply line of said toilet bowl;

an electric motor mounted on the wall and having a drive gear attached thereto:

a back plate spaced from the wall and positioned at the rear of said toilet bowl, said back plate having cheek blocks mounted thereon;

a pair of vertical parallel worm gears mounted at both ends to said cheek blocks;

a pair of upper guides attached to said mounting bracket and having bearings mounted thereon, said bearings threadably engaging said worm gears;

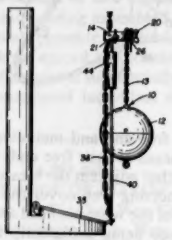
a pair of lower guides attached to said mounting bracket and disposed around said worm gears; and

idle sprockets attached to the upper portion of said worm gears, said idle sprockets chain driven by said drive gear.

4,091,474
FLUSH INTERRUPTING ATTACHMENT FOR TOILET TANKS

Walter Makhobey, 3109 E. Caley Ave., Littleton, Colo. 80121

Filed Jun. 21, 1976, Ser. No. 698,105
Int. Cl.[2] E03D *1/34, 5/02*
U.S. Cl. 4—379 **4 Claims**



1. A flush interrupting attachment for use in a toilet tank having an independently buoyant plug means normally resting in the seat of a water outlet opening when the toilet is not being flushed but being raised from the seat to allow passage of water when the toilet is being flushed, the plug means lowering to the seat to terminate water passage at a normally predetermined closing level of water in the tank, wherein the invention comprises:

(a) a buoyant member in the toilet tank for applying premature closing force to the plug means before the water level drops to the normally predetermined closing level;

(b) means for adjusting the buoyancy of said buoyant member to apply the required closing force to a plug means; and

(c) stiff connecting means attached to said buoyant member and contacting the plug means for transmitting the weight of the buoyant member to the plug means.

4,091,475
PORTABLE TOILETS

Clifford Bruce Hewson, Toronto, and John M. Stewart, Thornhill, both of Canada, assignors to Sanitation Equipment Limited, Downsview, Canada

Filed Nov. 4, 1976, Ser. No. 738,806
Int. Cl.[2] E03D *5/012, 11/10; F16K 1/16*
U.S. Cl. 4—321 **16 Claims**

1. A portable toilet comprising:

a bowl unit which defines a toilet bowl having a discharge opening, and a reservoir for a flushing liquid, said reservoir having a normally closed filler opening;

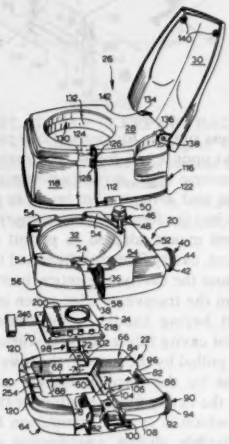
a holding tank normally disposed below and supporting said bowl unit, the holding tank having a top wall and defining a waste holding chamber having an inlet opening in said top wall for communication with the discharge opening of the toilet bowl, and a normally closed outlet opening, said top wall of the tank being contoured to define a depression in which said holding chamber inlet is disposed, and two generally flat bowl unit support surfaces located on respectively opposite sides of said depression and extending

generally longitudinally of said holding tank, and on which said bowl unit is supported;

means normally coupling said bowl unit and holding tank together in co-operating relationship when the toilet is in use, said means allowing the unit and tank to be separated at appropriate times;

pump means communicating with said reservoir in the bowl unit and with said toilet bowl and operable in use to deliver flushing liquid from said reservoir into said bowl;

valve means for controlling discharge of material from said toilet bowl into said holding chamber, said valve means being disposed in said depression in the top wall of the holding tank, said depression being dimensioned to provide at least partial protection for said valve means against damage when the holding tank is separated from the bowl unit, and said valve means including: a flap-form closure



member which is pivotable about an axis generally normal to the axis of said discharge opening of the toilet bowl between a closed position in which said member prevents communication between said discharge opening and said waste holding chamber, and an open position in which said closure member has pivoted downwardly clear of said opening to allow discharge of material from said toilet bowl into said chamber; and valve operating means located in a first plane generally parallel to a second plane containing said closure member when in its closed position and normally disposed below and supporting the member in said position, said valve operating means being retractable in said first plane to allow the closure member to pivot downwardly about its said axis and allow communication between said discharge opening of the bowl and the inlet of the waste holding chamber.

4,091,476

PORTABLE MALE URINAL

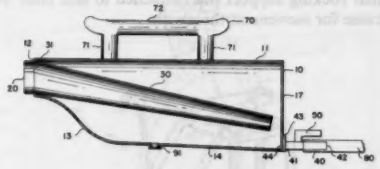
Ray DeBurgh, 1141 Laverne Way, Palm Springs, Calif. 92262

Filed Sep. 27, 1974, Ser. No. 510,056

Int. Cl.[2] A47K *11/00*; A61G *9/00*

U.S. Cl. 4—144.3 **3 Claims**

1. A portable male urinal comprising an elongate container, said container including a front having an orifice therein for receiving the male organ of a user, a back, a top, a bottom, and two concave sides, each said side curving outwardly between the top and the bottom so as to form an outwardly extending flange with said bottom whereby the shape of the sides generally conforms to the shape of the thighs of a user, each said flange being tapered along the length thereof from said back to said front so that said container fits comfortably between the thighs of the user thereby permitting extended use of said urinal over long periods of time without discomfort and further comprising an outlet tube disposed in said back at a location adjacent to said bottom and in communication with the interior of said container; valve means in said outlet tube for controlling the discharge of said outlet tube, said outlet tube having a means at the end thereof for connection with a length



of flexible tubing; and a handle located on said top, said handle including first and second spaced vertical support members and a horizontal cross bar member extending beyond said first and second support members whereby the length of flexible tubing connectable to said outlet tube can be wrapped about said handle.

4,091,477

BASES FOR SHOWERS

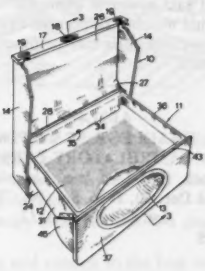
Robert Lewis, and Jack Lewis, both of Birmingham, England, assignors to Dolphin Showers (Patent) Limited, Worcester, England

Filed Jun. 18, 1976, Ser. No. 697,563

Claims priority, application United Kingdom, Jun. 20, 1975, 26259/75

Int. Cl.[2] A47K *1/00*

U.S. Cl. 4—146 **4 Claims**



1. A base for a shower comprising a carrier, a shower tray forming part of the carrier, the carrier being movable between a first position in which the tray extends substantially horizontally so that it can be used in taking a shower, and a second position in which it extends substantially vertically, the base being characterized in that it includes a wash basin also forming part of the carrier and which opens upwards for use in washing when the carrier is in its second position, said carrier having separate individual drainage means both discharging into a common drainage outlet which does not move with the carrier.

4,091,478

BATH TUB LIFT CHAIR APPARATUS

Charles W. Hardwick, 600 W. 27th St., Sanford, Fla. 32771; Ann Hardwick Smith, and Kinnaman Browning Smith, both of 702 Sargeant St., Waycross, Ga. 31501

Filed Feb. 25, 1977, Ser. No. 771,906

Int. Cl.[2] A47K *13/00, 3/12*

U.S. Cl. 4—185 L **11 Claims**

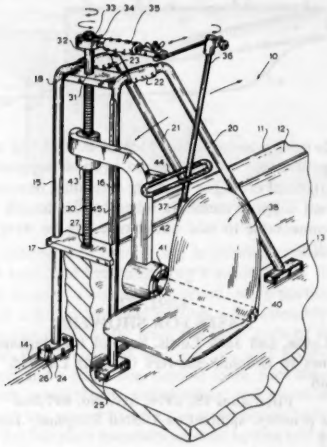
1. A bathtub lift chair comprising in combination:

a frame;

an elongated threaded member rotatably attached to said frame;

a chair support frame having a threaded portion operatively connected to said elongated threaded member for movement thereon responsive to the rotation of said elongated threaded member;

a chair rocking support shaft attached to said chair support frame for movement therewith;



a rockable chair rockable mounted on said chair support shaft; and

ratchet means connected between said elongated threaded member and said rockable chair for rotating said elongated threaded member responsive to the rocking of said chair, whereby said chair may be raised responsive to the rocking thereof.

4,091,479

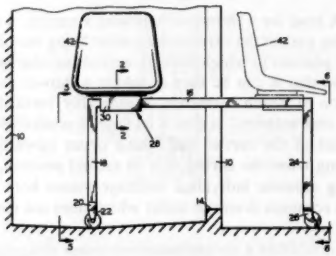
RAIL CHAIR FOR TRANSPORTING NON-AMBULATORY PERSONS

Robert D. Hancock, 1025-33rd Ave., Longview, Wash. 98632

Filed Dec. 20, 1976, Ser. No. 752,115

Int. Cl.[2] A47K *3/12*

U.S. Cl. 4—185 S **10 Claims**



1. A chair assembly for transporting non-ambulatory persons comprising in combination:

a. an elongated rail of non-circular cross section,

b. leg means on each end of the rail for supporting the same in substantially horizontal position,

c. a slide on the rail comprising a hollow case of non-circular cross section enclosing the rail and spaced therefrom, and bearing plates of self-lubricating plastic interposed between the case and the rail in bearing engagement with the rail,

d. a chair seat, and

e. pivotal mounting means interengaging the seat and case for rotatably mounting the seat on the slide.

4,091,480

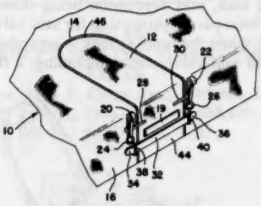
HOSPITAL MATTRESS WITH REMOVABLE INSERT

Samuel Oxenburg, 8838 Danbury St., Philadelphia, Pa. 19152

Filed Jun. 14, 1976, Ser. No. 695,364

Int. Cl.[2] A61G *7/04*

U.S. Cl. 5—91 **6 Claims**



1. In a mattress suitable for support of a patient and adapted for replacement upon a bed frame, said mattress having a top surface, a transverse edge, a cavity communicating with the transverse edge and a removable insert to alternately fill or expose the cavity, the improvement comprising flexible, sliding, engagement means adapted to permit movement of the insert from a first, cavity filling position and thence to a second position to expose the cavity, the entire insert being positioned outwardly from the transverse edge when in the second position, the insert having handle means adapted to return the insert to the first cavity filling position when the handle means is grasped and pulled by the patient, the insert being connected to the mattress by the flexible, sliding, engagement means when in either the cavity filling position or the cavity exposing position, and which is free of connection to the bed frame, wherein the flexible, sliding, engagement means includes at least one elastic strap, at least a portion of said strap is between the insert and the mattress when the insert is in the first position, wherein the strap is adjacent the insert when in the second position and clip means to slidingly secure the strap to the mattress, whereby movement of the insert by the patient without outside help is facilitated.

4,091,481

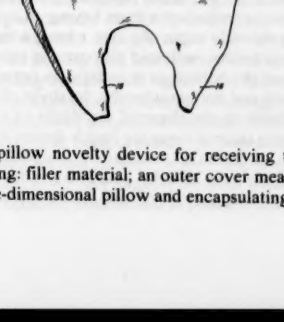
TOOTH PILLOW

Hallie G. Redman, 206 Aspen La., Highland Park, Ill. 60035

Filed May 9, 1977, Ser. No. 794,980

Int. Cl.[2] A47G *9/00*

U.S. Cl. 5—337 **1 Claim**



1. A tooth pillow novelty device for receiving tooth and coins comprising: filler material; an outer cover means shaped to form a three-dimensional pillow and encapsulating the filler

material; and pocket means secured to the outer pillow surface, the improvement comprising in combination:

the pillow being tooth-shaped and including an upper crown portion and at least one lower root projection;

the crown portion having raised cusp members about the upper surface thereof, the cusp members forming a top occlusel biting surface, a fossa formed between the cusp members and the occlusel surface;

the pocket means being secured to the upper crown portion below the fossa and above at least one root projection, the pocket having an upper tooth and coin receiving opening;

at least part of the outer tooth pillow surface is covered with tooth-loss related indicia;

whereby the "tooth fairy" may replace children's baby teeth situated in the pocket with coins or other valuable commodities.

4,091,482

INFLATABLE SLEEPING BAG

Richard Malcolm, Oakville, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Feb. 12, 1976, Ser. No. 657,645

Claims priority, application United Kingdom, Feb. 12, 1975, 05879/75

Int. Cl.[2] **A47G** *9/00*

U.S. Cl. 5—343 **20 Claims**

1. A mat comprising plural layers of impermeable material joined at the peripheral edges thereof to permit inflation as an air-mattress, inflatable blanket or component of a sleeping bag, containing an insulating amount of a tangle of lofting heat insulating material formed of shredded metallized plastic film having at least sections thereof in elongated strip form and oriented randomly in non-planar configurations, and valve means in one of said layers of impermeable material for inflation and deflation of the mat.

4,091,483

HOSE CLAMP TOOL

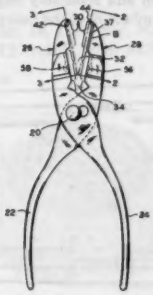
Joe Lewis, 14917 S. Hoyne, Chicago, Ill. 60426

Filed May 9, 1977, Ser. No. 794,830

Int. Cl.[2] **B25B** *7/22*

U.S. Cl. 7—132 **4 Claims**

1. A pliers-like tool comprising a pair of pivoted lever arms forming a pair of handles on one side of the pivot and a pair of opposed jaws on the other side of the pivot, the extremity of each of said jaws terminating in an outstanding tooth having a guiding cam surface on the inner side thereof, cutting means on the inner side of said jaws and positioned at the ends of said cams to receive and cut material picked up and guided by said tooth into the bite of the cutting means, an opposed pair of cavities respectively formed on said opposed jaws to receive the tip ends of a wire spring hose clamp, each of said opposing jaws including a pair of communicating channels extending away from each of said cavities, one of said channels extending



parallel to the associated jaw and the other of said channels extending perpendicular to the associated jaw.

4,091,484

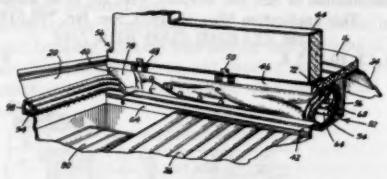
COLLAPSIBLE BOAT CANOPY AND STORAGE COMPARTMENT THEREFOR

John R. Means, Paso Robles, Calif., assignor to Porter, Inc., Decatur, Ind.

Filed Jun. 30, 1977, Ser. No. 811,687

Int. Cl.[2] **B63B** *17/02*

U.S. Cl. 9—1.5 **8 Claims**



1. In a boat having an open cockpit and a rear deck, the combination comprising:

a compartment underneath said rear deck having a forwardly facing opening,

a collapsible canopy being foldable to a generally horizontal position,

means attaching said canopy to the boat whereby said canopy may be slid rearwardly through said opening at least partially into said compartment,

a passenger seat immediately forward of said rear deck having a generally vertical backrest,

said backrest closing said compartment opening,

means connecting said backrest to the boat for movement between open and closed positions with respect to said compartment opening,

said rear deck including a top leading edge and said connecting means including said backrest being hingedly connected to said edge for pivotal movement about a horizontal axis.

4,091,485

COLLAPSIBLE STRUCTURE

Pierre E. Dohet, 109 South Lee St., Alexandria, Va. 22314

Filed Oct. 22, 1976, Ser. No. 734,999

Int. Cl.[2] **B63B** *7/06*

U.S. Cl. 9—2 C **20 Claims**

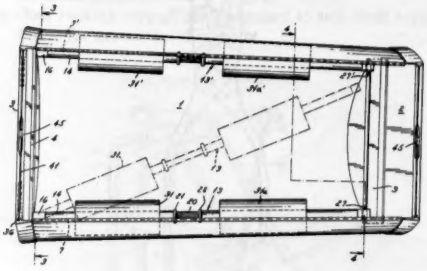
1. A boat structure adapted to be repeatedly collapsed and erected comprising:

substantially rigid free floating bow and stern members,

a flexible skin extending between and water-tightly joined to

said members and forming a hull portion therebetween having upper free marginal gunwale edges,

elongated telescopically compressible distensible means extending between and separably engaging each of said bow and stern members near the outer peripheries thereof



to urge them apart and stress the skin member therebetween to form the hull configuration, and

means on one of said members extending transversely thereof for slidably cooperating with the distensible means to assist in telescopically compressing said distensible means.

4,091,486

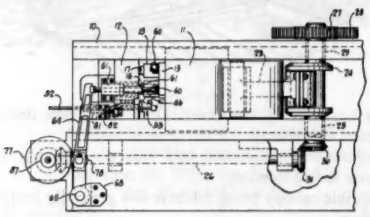
PUNCH KNOCK-OUT MECHANISM FOR HEADER

William E. Kalt, Bay Village, Ohio, assignor to Kalt Manufacturing Company, North Ridgeville, Ohio

Continuation of Ser. No. 659,658, Feb. 20, 1976, abandoned. This application May 19, 1977, Ser. No. 798,615

Int. Cl.[2] B21D *45/00;* B21K *1/44*

U.S. Cl. 10—11 E **8 Claims**



1. In a header having a frame including a fixed die support, a tool slide supported by the frame for lineal movement toward and away from the die support, a crankshaft rotatably supported by the frame and operably connected to the tool slide for reciprocating the tool slide toward and away from the die support, a punch assembly carried by the tool slide including a punch aligned with a die carried by the die support and a punch knock-out pin and a pivoted punch knock-out lever for advancing the punch knock-out pin when moved in one direction about its pivot, a knock-out actuating shaft driven by the crankshaft and extending parallel with the path of movement of the tool slide, a knock-out lever actuating mechanism comprising: a first housing, a rod slidably supported by said housing and extending from one side thereof, means for connecting said first housing to the frame of the header adjacent to the die support with said rod slidably supported thereby extending toward the tool slide and in alignment with and in position when moved in one direction to contact the knock-out lever of the punch assembly of the header, a spring acting on said rod to urge it in the direction opposite to said one direction, a lever pivotally connected to the frame of the header and having one end engaged with said rod for moving said rod against the force of said spring, the other end of said lever being connected to the frame of the header, a second housing, means for connecting said second housing to the frame of the header, a cam shaft rotatably supported by said second housing, gearing on said cam shaft for connection to the knock-out actuating shaft of the header, a cam on said cam shaft for moving said lever about its pivot for moving said rod in said one direction in timed relation to the movement of said tool slide to engage the knock-out lever of the punch assembly of the header as the tool slide moves away from the die support.

4,091,487

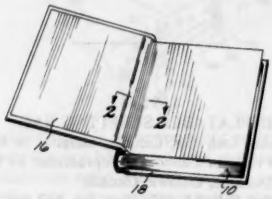
METHOD FOR BINDING BOOKS

Herbert R. Axelrod, 211 West Sylvania Ave., Neptune, N.J. 07753

Filed Nov. 24, 1975, Ser. No. 634,546

Int. Cl.[2] B42C *19/00;* B42D *1/00*

U.S. Cl. 11—1 AD **3 Claims**



1. A method of binding hard cover books, including:

printing a plurality of signatures;

folding said signatures;

collating said printed signatures to position the folded-over edges of adjacent signatures in juxtaposition with one another to form a back bone and to place the pagination in seriatum;

cutting of said back bone to separate the edges of each page of said signatures from one another to form a flat cut off back surface;

applying flowable glue to said back surface and in between the edges of adjacent edges of said pages along said back surface;

providing a paper cover of heavier stock than said signatures and of sufficient size to form opposite sides to cover the opposite sides and a back side to cover the back surface of said collated signatures;

pressing said back side of said paper cover to said glue along said back surface;

providing a hard cover of sufficient size to cover the opposite exteriors of said paper cover and to pass around the back side of said cover and of sufficient flexibility along the opposite sides of said back to form respective hinges therealong; and

gluing the interior surfaces of the opposite sides of said hard cover to the exterior surfaces of the opposite sides of said paper cover and the back of said cover to cooperate therewith in forming a spine.

4,091,488

DOCKBOARD UTILIZING A GAS SPRING FOR COUNTERBALANCING

Thomas G. Artzberger, Menomonee Falls, Wis., assignor to Kelley Company Inc., Milwaukee, Wis.

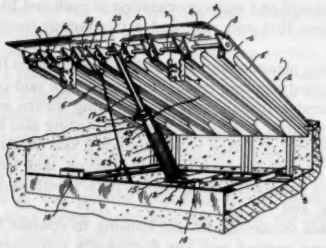
Filed Jan. 12, 1977, Ser. No. 758,666

Int. Cl.[2] E01D *1/00*

U.S. Cl. 14—71.7 **15 Claims**

14. In a dockboard, a supporting structure, a ramp member hinged at its rear edge to the supporting structure and movable between a generally horizontal cross traffic position and an upwardly inclined position, a lip hinged to the forward edge of the ramp member on a hinge axis and movable between a downwardly hanging pendant position and an extended position, elevating means operably connected to the ramp member for moving the ramp member to its upwardly inclined position,

an arm member engaged with the undersurface of the lip and mounted for movement with respect to said hinge axis, a gas spring assembly including a cylinder pivotally connected to one of said members and containing a quantity of a compressible gas, a piston mounted for sliding movement within the cylinder, orifice means disposed in the piston whereby the gas can pass through the piston on movement of said piston within the cylinder, a piston rod connected to the piston and extending outward of said cylinder and pivotally connected to the other of said members, the force differential on opposite faces



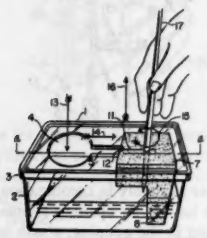
of said piston acting to bias the piston rod to an extended position, the axis of said cylinder being arranged relative to the hinge axis when the lip is in the pendant position such that the biasing force of said gas spring assembly is substantially nullified, means for swinging the lip from the pendant position toward the extended position and for moving the axis of said cylinder to an undercenter position with respect to said hinge axis, whereby the biasing force of said gas spring assembly will act through said arm to assist in moving the lip toward the extended position.

4,091,489

BRUSH POINTER

Jack Nimetz, 1605 Timberline Rd., Silver Spring, Md. 20904

Filed Jun. 15, 1976, Ser. No. 696,473
Int. Cl.[2] A46B *17/06;* B05C *11/105*
U.S. Cl. 15—104.92 **6 Claims**



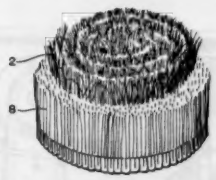
1. A device for cleaning bristles of a brush and for pointing the bristles comprising means forming a reservoir for a liquid adapted to clean the bristles, a top for said reservoir, said top including: (a) a guide aperture through which the brush bristles can be inserted to enable the bristles to be inserted into the liquid, and (b) a point forming aperture communicating with the guide aperture to receive the brush from the guide aperture, said point forming aperture having a pair of resilient normally contacting lips that are urged apart in a region in contact with the brush but which surround and contact the moist bristles to control the shape of the bristles as the bristles are drawn through the forming aperture from the reservoir, further including drawing means for moistening the lips with liquid from the reservoir, wherein the drawing means includes capillary means extending from the reservoir to the lips.

4,091,490

SKIN CLEANSING DEVICE

Michael L. Allen, 13011 Meridian Ave. S. #M-202, Puyallup, Wash. 98371

Filed Oct. 14, 1976, Ser. No. 732,466
Int. Cl.[2] A46B *3/08;* A47K *7/02*
U.S. Cl. 15—159 A **4 Claims**



1. A skin cleansing device comprising

a backing member in the form of a strip of flexible material,

skin contacting elements of human hair attached along and extending outwardly of said backing member and being of sufficient length and flexibility that, when wetted and brought into cleansing contact with the skin of the user, said skin contact is predominantly with the sides of said hair elements rather than the ends thereof,

means forming and maintaining said elongated backing member and attached hair elements in a configuration with portions of said backing member strip and hair elements in generally adjacent side-by-side relationship with other said portions, and

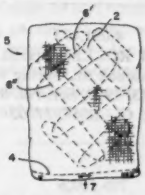
a spacing element comprising tassles of textile material interposed between adjacent said side-by-side portions of said hair elements attached to said backing strip, said tassles extending generally in the same direction as said hair elements.

4,091,491

SKIN CARE MITT

Sara M. Hoffman, 22431 Michale St., Canoga Park, Calif. 91304

Filed Aug. 11, 1976, Ser. No. 713,375
Int. Cl.[2] A47K *7/02*
U.S. Cl. 15—227 **1 Claim**



1. A skin care device adapted to remove dead, dormant skin comprising:

a cloth mitt member having a closed end, an open end, and at least one outer rubbing surface extending therebetween; and

a raised surface pattern of thread stitching distributed over a substantial portion of the area of said rubbing surface in at least one continuous path of stitching forming connected parallel lines;

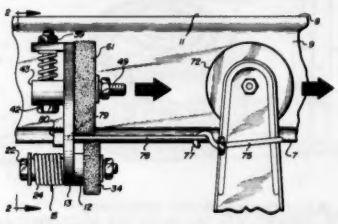
said rubbing surface being of a material selected from the group consisting of boat sail, canvas, and denim said path of thread stitching forming a smooth transition at the connection of each pair of parallel lines and said raised surface pattern extending in parallel lines at approximately 45° from a line joining the centers of said ends.

4,091,492

CLEANING DEVICE FOR CONVEYOR SYSTEM RAIL

Ronald E. Thomson, Cambridge, and James F. Schmitt, Marshall, both of Wis., assignors to Madison-Kipp Corporation, Madison, Wis.

Filed Jan. 27, 1977, Ser. No. 763,044
Int. Cl.[2] E01H 8/12; A46B 15/00
U.S. Cl. 15—246 4 Claims



1. A device for removing foreign particles from a rail member comprising a vertical section having side walls and an integral bottom flange having top and bottom surfaces and upon which a trolley means is adapted to travel, said device comprising:

a plate member having two ends;

a pair of arm members, each of which is pivotally connected to an end of said plate member;

each of said arm members comprising a U-shaped section and a brush mounting holder portion having a lug extending from a wall of said portion;

a first pair of brush assemblies including corresponding brushes adapted to contact the sides of said rail member, each of said first brush assemblies being connected to the lug of a corresponding one of said arm members;

spring means for biasing said arm members relative to said rail such that said first brush assembly brushes contact said side walls of said rail member, said bottom flange of said rail member being adapted to be disposed in the area of the hollow of each of said U-shaped sections;

a second brush assembly mounted to said plate member and having brushes adapted to contact the bottom surface of said rail member bottom flange; and

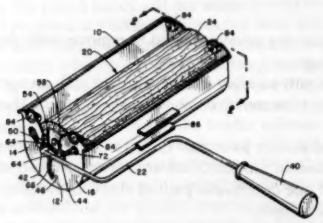
means for connecting said device to a trolley means adapted to travel on said rail member.

4,091,493

PAINT ROLLER SHIELD

Nathan Weiss, 927 Parkbrook St., Spring Valley, Calif. 92077

Filed Jul. 13, 1977, Ser. No. 815,082
Int. Cl.[2] B05C 17/02
U.S. Cl. 15—248 A 6 Claims



1. A paint spray and drip shield adapted to be used with a conventional paint roller and handle wherein the roller is rotatably mounted on the handle, said paint spray and drip shield comprises:

a housing including an elongated center member which has a first pair of upstanding end walls at the ends thereof, a front member hingedly connected to one side of said center member, a back member hingedly connected to the opposite side of said center member, said front member terminating in a second pair of upstanding end walls, said back member terminating in a third pair of upstanding end walls, said front and back members being substantially mirror images of each other, with said front and said back members in abutting contact with said center member there is formed an elongated U-shaped chamber within which is to be located a paint roller, with said center member in abutting contact with said front and said back members said end walls cooperating at each end to form a continuous first end wall and a continuous second end wall;

first securing means connected with said continuous first end wall, second securing means connected with said continuous second end wall, said first securing means and said second securing means cooperating to secure said housing to a conventional paint roller assembly, said first and said second securing means normally biasing said front and said back members into abutting contact with said center member; and

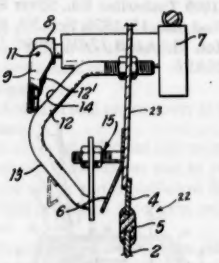
roller means connected to said housing to contact the surface being painted and low frictionally roll there along keeping said housing slightly spaced from the surface to be painted.

4,091,494

WINDOW WIPER ASSEMBLIES FOR VEHICLES

Geoffrey Dunhill, Worksop, and Edgar R. Halstead, Doncaster, both of England, assignors to International Harvester Company, Chicago, Ill.

Filed Jun. 1, 1976, Ser. No. 691,645
Claims priority, application United Kingdom, May 30, 1975, 23573/75
Int. Cl.[2] B60S 1/04
U.S. Cl. 15—250.16 2 Claims



1. A window wiper assembly in combination with a vehicle cab, the vehicle cab having an opening forming a window, a window frame carried in the opening, a sash including a windowpane framed in the sash supported by the frame and being moveable relative thereto for opening and closing the window, and the window wiper assembly having a wiper drive supported on the window frame above the sash, a wiper arm having one end connected to the wiper drive and a swingable end connected to a wiper blade, wherein the improvement comprises:

a cam supported on the frame above the sash and laterally spaced from the wiper drive, the cam having a first cam surface means connected to the frame engageable with the wiper arm upon upward swinging of the wiper arm to an inoperative position for lifting the wiper blade off of the windowpane, and having a second cam surface means connected to the frame for supporting the wiper arm after further upward swinging of the wiper arm to a parked position and for disposing the wiper blade in an out of the

way position relative to the sash to permit the opening of the window without interference with the wiper blade; and

wherein the first cam surface has a lower end connected to the frame and disposed laterally adjacent to the top of the sash and extending upwardly and outwardly therefrom and forming a guide means for the wiper arm for lifting the wiper blade from the windowpane and elevating same over the sash, and the second cam surface has an upper end connected to the frame and extending downwardly and outwardly therefrom and merging with the first cam surface means at a gentle peak forming a second guide means for the wiper arm for maintaining the wiper arm past the peak and at a raised position over the sash; and

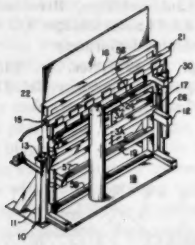
wherein the lower end of the first cam surface is connected to a plate having an opening, and further including lateral and angular adjusting means carried on the frame and passing through the opening in the plate for laterally spacing the plate from frame and angularly adjusting the lower end of the first cam surface about the connection of the upper end of the second cam surface to the frame, the lateral and angular adjusting means further including locking means for locking the cam in the selected lateral and angular position.

4,091,495

GAS CYLINDER WASHING, DRAINING AND/OR DRYING APPARATUS

Åke Lars. G. Aspenlind, 9595 Mira Del Rio Dr., Sacramento, Calif. 95827

Filed May 17, 1976, Ser. No. 686,920
Int. Cl.[2] A47L *5/38*
U.S. Cl. 15--304 **9 Claims**



1. Apparatus for washing, draining, and/or drying gas cylinders having cylindrical bodies, each having a neck and an axial opening in the neck communicating with the interior of the cylindrical body, comprising:

a stationary frame,

a movable frame pivotally carried on said stationary frame and having a shelf for supporting the cylindrical bodies,

a vertically adjustable header reciprocably mounted on said movable frame and having bumper means on said header for engaging the necks of the cylinders for clamping the cylinders against the shelf so that the cylinders are held against movement during pivoting of the movable frame to an inverted cleaning, draining, or drying position,

means for reciprocating the header toward said shelf and adapted for moving the bumper against the necks of the cylinders on the shelf to clamp the cylinders on the shelf,

means for pivoting said movable frame sufficient to invert the movable frame for draining the cylinders by gravity, and

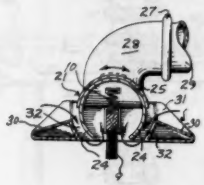
means on said header adapted for injecting a fluid into the cylinders.

4,091,496

VACUUM CLEANER NOZZLE

Wilfrid Desrosiers, 6 Cournoyer Street, and Jean-Marc Landry, 11 Kennedy Street, both of Kapuskasing, Ontario, Canada

Filed Oct. 28, 1975, Ser. No. 626,026
Int. Cl.[2] A47L *9/06*
U.S. Cl. 15—371 **2 Claims**



1. A vacuum cleaner nozzle comprising an elongated hollow body portion and a rim surrounding said body portion and removably attached to the latter, said body portion defining a vacuum chamber therein and having a suction mouth extending longitudinally of its underside, said body portion having a middle section with an outside wall of circular cross-sectional shape and having an outlet opening, a swivel tubular coupling for connecting, through said opening, the vacuum chamber to a vacuum source, and including an inlet opening surrounded by a substantially semi-cylindrical flange slidably fitted over said cylindrical outside wall around said outlet opening for swinging slidable movement of said tubular section around said outside wall, holding lugs projecting from said outside wall and overlying opposite sides of said flange to retain the latter in slidable contact with said outside wall, said hollow body portion having end walls closing the ends thereof, each end wall having co-planar tongues projecting from the front and rear thereof, said rim including end plates and a pair of lateral edge portions rigidly interconnecting said end plates, said end plates applied against the outside of said end walls, lugs projecting from the inside face of said end plates and forming grooves with said end plates, said grooves being sized to slidably receive said tongues, whereby said body portion has a removable slidable connection with said rim at both ends of said body and rim, said rim forming a unitary assembly with said body pivotable as a whole relative to said coupling by relative slidable movement of said flange on said outside wall, said lateral edge portions extending parallel to, and equally spaced from, the sides of said body portion over the entire length thereof on opposite sides of said mouth to define with said sides elongated air inlet slots extending longitudinally of said body portion and directed towards said mouth.

4,091,497

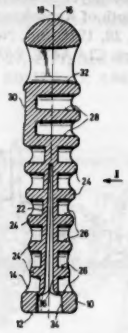
HANDLE FOR FILES AND SIMILAR TOOLS

Walter Bade, Brauck 10, 5805 Breckerfeld, Germany

Filed Dec. 20, 1976, Ser. No. 752,118
Int. Cl.[2] B25G *1/00, 1/10*
U.S. Cl. 16—110 R **5 Claims**

1. A handle of elongated shape substantially symmetrical with respect to a handle axis for a file, a ratchet or another tool having a tang to be driven axially into said handle and subjected, in use, to reciprocal forces parallel to said axis, the handle being made of a plastic material and being provided with an axial opening to receive said tang, said opening extending, from a first end of the handle, thereinto over less than the entire length thereof, said opening having a substantially flat-rectangular section shape except a first portion adjacent thereof said first handle end where said opening has a circular section of a diameter equal to or greater than the greatest

sectional dimension of said tang, the axial length of said first opening portion being substantially equal to the axial extension



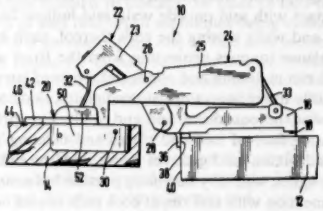
of a bulge rim provided at said first handle end, the entire handle being integrally molded.

4,091,498

HINGE FOR FURNITURE

Reinhard Lautenschläger, Reinheim, Odenwald, Germany, assignor to Karl Lautenschläger KG Möbelbeschlagfabrik, Reinheim, Odenwald, Germany

Filed Mar. 24, 1977, Ser. No. 780,783
Claims priority, application Germany, Apr. 17, 1976, 2617071
Int. Cl.[2] E05D *5/00*
U.S. Cl. 16—128 R 2 Claims



1. A cabinet hinge for use in a piece of furniture having a door and a door-supporting wall, said hinge having a door part, an elongated support arm, a linkage pivotingly joining said door part to said elongated support arm and having pivots at said door part, a mounting plate for disposition on the door-supporting wall and having means for longitudinally adjustably fastening said support arm to said mounting plate, said door-part being in the form of a cup fastenable in said recess and having a mouth for receiving said pivots, and two projecting strips arranged directly adjacent said mouth and extending at right angles to the imaginary pivot axis of said hinge and parallel to each other.

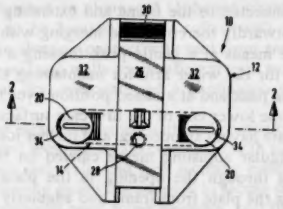
4,091,499

MOUNTING PLATE FOR FURNITURE HINGES

Karl Lautenschläger, Reinheim, Odenwald, Germany, assignor to Karl Lautenschläger KG Möbelbeschlagfabrik, Reinheim, Odenwald, Germany

Filed Apr. 14, 1977, Ser. No. 787,473
Claims priority, application Germany, Jun. 1, 1976, 2624453
Int. Cl.[2] E05D *7/04*
U.S. Cl. 16—129 12 Claims

1. A mounting plate for the installation of the supporting wall part of a cabinet hinge on a piece of furniture, said mounting plate being composed of a bottom piece to be applied directly to the supporting wall and a top piece displaceable on this bottom piece parallel to the hinge pivot axis and mounted thereon for selective fixation, fastener means for connecting said bottom piece and said top piece on the supporting wall, said fastener means being spaced apart from one another in line with the adjustment direction and passing through openings in the top and bottom piece, said fastener means being adapted to be driven into bores in said supporting wall, said openings in said top piece being in the form of elongated openings extending in the adjustment direction so that said top piece is dis-



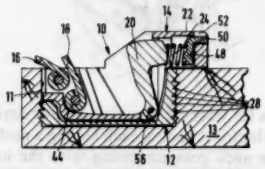
placeable in the elongated holes relative to the bottom piece when the fastening means are loosened while said bottom piece is held in place relative to the supporting wall, adjusting means between said top piece and said bottom piece, which engages said bottom piece and said top piece and is accessible through an opening in the top piece for engagement by a tool, adjustment of said adjusting means effecting a positive relative displacement of said top piece and said bottom piece.

4,091,500

CABINET HINGE

Gerbard Wilhelm Lautenschläger, Brensbach-Wersau, Germany, assignor to Karl Lautenschläger KG Möbelbeschlagfabrik, Reinheim, Odenwald, Germany

Filed Apr. 28, 1977, Ser. No. 791,772
Claims priority, application Germany, Jul. 31, 1976, 2634558
Int. Cl.[2] E05D *11/10*
U.S. Cl. 16—145 7 Claims



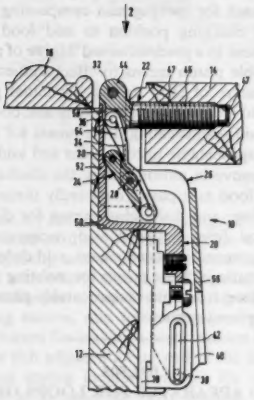
1. A cabinet hinge having a supporting wall part and a two-piece door part which is constructed as an inlet housing having an outer, cup-shaped housing piece adapted to be fastened in a mating inlet in a cabinet door and having at least one recess, and a separate insert piece adapted to be fitted into the outer housing piece and snap-fastened therein and which is pivotingly linked to said supporting wall part, an over-center mechanism integrated in said insert piece and formed of a spring-biased tongue cooperating with a counter-surface, a spring mounted in the insert piece and pretensioning said tongue, a locking element engaged by the extremity of the spring remote from the tongue, said locking element being displaceably mounted at the insert piece and provided with at least one catch projection means which, when the insert piece is in its proper position in the outer housing piece, catches in said at least one recess.

4,091,501

CANTILEVER HINGE

Karl Lautenschläger, Reinheim, Odenwald, and Gerhard Lautenschläger, Brensbach-Wersau, both of Germany, assignors to Karl Lautenschläger KG Möbelbeschlagfabrik, Reinheim, Odenwald, Germany

Filed Feb. 22, 1977, Ser. No. 770,832
Claims priority, application Germany, Mar. 6, 1976, 2609413
Int. Cl.[2] E05D 3/08
U.S. Cl. 16—166 7 Claims



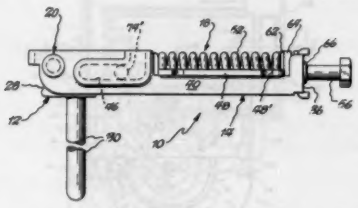
1. Knuckle joint hinge, especially for rabbeted doors of period furniture to be opened up to an angle of 180°, said hinge having a supporting wall part and a door part, a knuckle joint mechanism joining together said supports and having two link arms recoupled pivotingly with one another in their middle area, one of the ends of the link arms being coupled to the supporting wall part of the hinge in the one case and to the door part of the hinge in the other, while the other end in each case is coupled in a sliding guide or indirectly through a link to the other hinge part, the supporting wall part of the hinge being adapted to be fastened to a mounting plate mounted adjustably on the inside of the supporting wall, the supporting wall part of the hinge, which is adapted to be fastened in its rearward area on the mounting plate, being bent twice in opposite directions in its forward area ahead of the mounting plate, such that, in this forward area, it lies in an open-fronted, elongated recess provided in the supporting wall, the link arm directly articulated to the supporting wall part of the hinge being articulated to the supporting wall part of the hinge in said forward area of the supporting wall part of the hinge within the elongated recess, said link arm directly articulated to the door part of the hinge being bent twice contrariwise corresponding approximately to the supporting wall part of the hinge, so that the forward area of the link arm likewise lies in the elongated recess in the supporting wall and protrudes from the recess at the face edge of the supporting wall, the articulation point of the link arm directly articulated to the door part of the hinge being provided immediately beside the edge of the door which is to be hinged and in front of the face edge of the supporting wall, the parts of the door part of the hinge and of the link arm, which are visible when the door is closed, comprising a hinge pin and visible sleeves joint by said pin to thereby present the appearance of the articulation of a single-pivot hinge.

4,091,502

COUNTERBALANCE MECHANISM

Carl H. Little, Jamestown, N.Y., assignor to Weber-Knapp Company, Jamestown, N.Y.

Filed Nov. 10, 1976, Ser. No. 740,430
Int. Cl.[2] E05F 1/12, 5/14
U.S. Cl. 16—190 2 Claims



1. A mechanism for use in counterbalancing the weight of a lid supported on a cabinet for vertical swinging movements between closed and open positions, said mechanism comprising:

a stationary hinge part adapted to be fixed to said cabinet;

a movable hinge part;

hinge pin means for pivotally connecting said movable hinge part to said stationary hinge part for vertical swinging movements relative to said cabinet about an essential horizontal hinge axis, said movable hinge part being adapted to be coupled to said lid for conjunctive vertical swinging movements when said movable hinge part is swung about said hinge axis;

one of said hinge parts defining cam means, said cam means including a pair of aligned cam elements having cylindrical surface portions arranged in a parallel offset relationship relative to said hinge axis;

the other of said hinge parts being of generally U-shaped configuration including a connecting portion and a pair of parallel leg portions extending therefrom, said connecting portion having a through opening, said leg portions having aligned openings to receive said hinge pin means;

a connector defining cam follower means, said cam follower means including a pair of parallel flange members arranged to straddle said one of said hinge parts, said flange members defining aligned cam follower surfaces arranged for bearing surface-to-surface sliding engagement one with each of said cylindrical surface portions, said cam follower surfaces being planar;

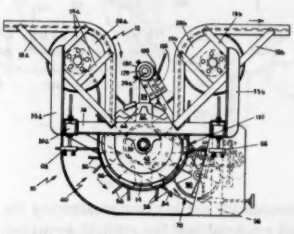
mounting means for mounting said connector for reciprocating movement relative to said other of said hinge parts, said mounting means including a bolt having one end received for bearing engagement within an opening formed in said connector and an opposite end movably supported within said through opening of said connecting portion and a pair of aligned guide pin elements fixed to said connector and slidably received one within each of a pair of aligned guide slots formed in said leg portions, said guide pin elements being arranged essentially parallel to said hinge axis and to intersect the axis of said bolt, said guide slots extending co-directionally with said axis of said bolt and having open ends for receiving said guide pin elements, said axis of said bolt being arranged to intersect the line of said surface-to-surface engagement when said lid is in said closed position; and

spring means arranged to bear adjacent opposite end thereof on said connector and said connecting portion for biasing said cam follower surfaces into surface bearing engagement with said cylindrical surface portions whereby to establish a moment acting about said hinge axis and tending to counterbalance the torque effects of gravity on said lid during said vertical swinging movements thereof.

4,091,503
NECK-BREAKING AND STRETCHING APPARATUS FOR POULTRY

Gaston M. Fox, Albany, and Thomas H. Wright, Gainesville, both of Ga., assignors to Barker International, Inc., Marietta, Ga.

Filed Dec. 14, 1976, Ser. No. 750,571
Int. Cl.[2] A22C *21/00*
U.S. Cl. 17—11 38 Claims

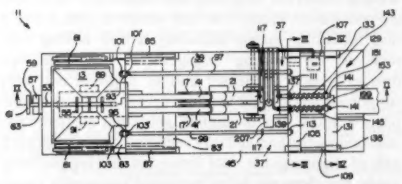


1. Poultry processing apparatus for cutting and breaking the necks of fowl comprising movable support means for suspending and moving at least one fowl along a path in an inverted position with its neck down; holding means for positioning at least the neck of a fowl; cutting means for cutting an incision partially through the neck of said fowl to a controlled depth and breaking the bone in said neck; said holding means being movable along a portion of and adjacent to said path and synchronized with said movable support means; said cutting means also being movable along and adjacent to at least a portion of said path; stationary stretching means for engaging the fowl neck and stretching and opening said incision and separating the bone in said fowl neck, said stationary stretching means including a rigid member positioned generally transverse to said path of the fowl and generally transverse to the neck of the fowl, whereby said apparatus prepares said fowl neck for withdrawal of its windpipe, esophagus and crop through said incision.

4,091,504
APPARATUS FOR PORTIONING EXTRUDABLE FOOD

Shing Kuel Wong, 901 S. Perkins, Memphis, Tenn. 38117

Filed Jan. 10, 1977, Ser. No. 757,822
Int. Cl.[2] A22C *11/04*
U.S. Cl. 17—32 13 Claims

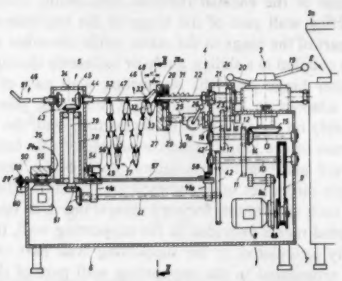


1. In a food extruding apparatus of the type having a hopper for receiving a supply of the food to be extruded and means disposed within said hopper for withdrawing food from said hopper and continuously urging the food past a normal discharge point, the improvement which comprises food chamber means having a size and shape substantially resembling each measure of food to be incorporated therein, said food chamber means being defined by a rearward portion and a forward portion with said forward portion defining a food discharge opening, said food chamber means being provided with an inlet opening disposed adjacent said rearward portion and being communicated with said normal discharge point whereby the food is caused to flow into said food chamber means, reciprocatable piston means disposed within said food chamber means and being movable between said rearward and forward portion thereof, reciprocating drive means attached to said reciprocatable piston means for causing reciprocating movement thereof with said reciprocatable piston means being caused to move past said inlet opening thus the initial movement thereof interrupts the flow of the food into said food chamber means, compacting head means disposed adjacent said forward portion of said food chamber means and being movable between a food charging position and a food discharging position, said compacting head means occluding said food discharge opening when disposed in said food charging position and said food discharge opening being unobstructed when said compacting head is disposed in said food discharging position, delayed action drive means for moving said compacting head means from said food charging position to said food discharging position subsequent to a predetermined degree of movement of said reciprocatable piston means to effect optimum compactness of the measure of food during the initial phase of the movement of said reciprocatable piston means, coupling means coacting with said reciprocating drive means for subsequently causing said reciprocatable piston means and said compacting head means to move in unison during the discharge phase of the measure of food as it passes outwardly through said food discharge opening, and dislodging means for dislodging the measure of food from between said reciprocatable piston means and said compacting head means, said dislodging means including pneumatic jet blast means for assisting in dislodging the measure of food from said reciprocatable piston means and said compacting head means.

4,091,505
SUSPENDING APPARATUS FOR LOOPS OF SAUSAGE LINKS

Johann Müller, Biberach, and Georg Staudenrausch, Biberach-Rissegg, both of Germany, assignors to Firma Albert Handtmann, Biberach, Germany

Filed Mar. 11, 1977, Ser. No. 777,152
Claims priority, application Germany, Mar. 12, 1976, 2610315
Int. Cl.[2] A22C *11/00*
U.S. Cl. 17—33 35 Claims



1. An apparatus for suspending a chain of sausage links in respective loops, comprising:

means feeding a succession of sausage links forming a sausage chain along a feed axis;

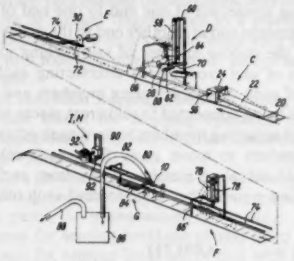
a pickup member rotatable about a pickup axis laterally offset from said feed axis and provided with a first portion lying on said pickup axis, an elbow at the end of said first portion, and a pickup arm inclined to said feed axis and extending from said elbow toward the path of said sausage links advanced along said feed axis, said arm extending generally radially with respect to said pickup axis; and

means for rotating said member to cause said arm to orbit about said feed axis and tangentially engage a loop of the sausage links and guide the same toward said pickup axis.

4,091,506
FISH CLEANING MACHINE AND METHOD

Ejnar Soerensen, and Lars Svanborg, both of Viborg, Denmark, assignors to Ejnar Soerensen, Denmark

Filed Jul. 1, 1975, Ser. No. 592,358
Claims priority, application United Kingdom, Jul. 4, 1974, 29625/74
Int. Cl.[2] A22C *25/16*
U.S. Cl. 17—52 **23 Claims**



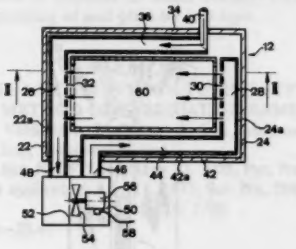
1. A machine for automatically cleaning fish of the type to be sold with a head of the fish remaining on a fish body, the machine comprising a row of fish holders each operable to receive a fish with a belly side thereof exposed, said fish holders being movable past a plurality of treating stations including a head cutting station, said head cutting station including a cross cutting means for making a cross incision in a lower body portion of the fish adjacent a rear end of the head of the fish, a belly cutting station including means for cutting the fish lengthwise so as to open the belly thereof, and a cleaning station including means for removing the gills and entrails from the opened fish, characterized in that said cross cutting means are arranged so as to make said first incision approximately along a lower and rear end of gill blades of the fish, and in that a second cross cutting station is arranged between said head cutting station and said cleaning station, said second cross cutting station comprising cutting means operable to cut lower ends of gill arches and clavigulae of the fish approximately where these are joined to the tongue arch of the fish, said cutting means of said second cross cutting station are constituted by a chisel which is narrow enough to be able to pass between the gill cover blades of the fish without causing substantial damage to the gill cover blades, the chisel being reciprocable between a retracted position and an advanced position in which the chisel cuts through the gill arches and the clavigulae.

4,091,507
MOUNTING APPARATUS FOR A TEXTILE MACHINE, ESPECIALLY A CARD

Hanspeter Sutter, Uster, Switzerland, assignor to Luwa AG, Zurich, Switzerland

Filed Sep. 29, 1976, Ser. No. 727,763
Claims priority, application Switzerland, Oct. 4, 1975, 12851/75
Int. Cl.[2] D01G *15/82*
U.S. Cl. 19—107 **2 Claims**

1. A mounting apparatus for a textile machine, in particular a carding machine, comprising support means for maintaining the textile machine in spaced relationship from a foundation supporting the textile machine, a pneumatic cleaning device having blow- and suction openings arranged at least beneath the textile machine, a pressure connection and suction connection, air channels separate from said support means and communicating with the pressure connection and suction connection, said support means having hollow spaces, the air channels being constructed with respect to their flow characteristics independent of the support means and being interfittingly arranged in the hollow spaces of said support means, said air channels comprising profile-like elements located in a plane, said profile-like elements piercingly extending through said support means in the lengthwise direction thereof, and said air channels enclose in an approximately frame-like manner the

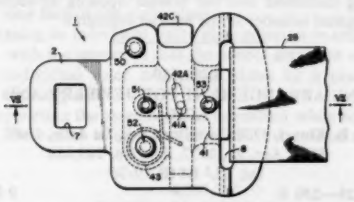


outline of the textile machine, said support means comprising spaced apart hollow profile elements arranged at predetermined locations along said air channels and straddling said air channels, said spaced apart hollow profile elements providing means for allowing air to escape from the hollow spaces of the support means.

4,091,508
TONGUE PLATE DEVICE FOR USE IN SEAT BELT SYSTEM

Makoto Yamada, Seto, and Eiichi Kinaga, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 3, 1975, Ser. No. 637,474
Claims priority, application Japan, Jul. 30, 1975, 50-92879
Int. Cl.[2] A44B *11/06*
U.S. Cl. 24—171 **8 Claims**



1. A tongue plate device for use in a three-point seat belt system of the kind using a continuous webbing consisting of a lap belt and a shoulder belt for restraining an occupant onto a seat of a vehicle, comprising a tongue plate having a buckle engaging portion at one end thereof and a webbing passage portion at the other end thereof, a locking plate engaging said webbing at said webbing passage portion of said tongue plate for locking said webbing against passing movement, resilient means for normally urging said locking plate in the locking direction, and releasing means for urging said locking plate in the releasing direction so as to unlock said webbing from said locking plate, said releasing means being operatively connected to said locking plate by cam means and having an edge protector provided in said webbing passage and coupled to said tongue plate, wherein said releasing means comprises a push rod which acts to move said locking plate in a direction normal to the moving direction thereof through said cam means, and said resilient means comprises a torsion coil spring which is mounted on a pin fixed to said tongue plate and is anchored to said locking plate and said push rod at the respective ends thereof.

4,091,509

SLIDE FASTENER WITH BOTTOM STOP

Norman W. MacFee, Conneaut Lake, Pa., assignor to Textron Inc., Providence, R.I.

Filed Dec. 20, 1976, Ser. No. 752,825
Int. Cl.[2] A44B 19/36
U.S. Cl. 24—205.11 R 5 Claims

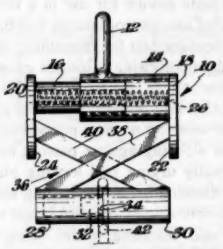
1. A slide fastener with a bottom stop comprising
a pair of carrier tapes,
a pair of elongated coupling members attached to the inner edges of the respective carrier tapes,
a slider movably mounted on the coupling members,
each of the coupling members being a coil formed from a continuous filament and having successive convolutions with head portions for meshing and interlocking with the convolutions of the opposite coupling member,
said coils having bottom segments meshed together,
each of the coils formed with a central opening extending longitudinally therethrough and which partially coincides with the central opening of the opposite coil at the meshed bottom segments of the coils,
an elongated member extending in the coinciding portions of the central openings in the bottom segments of the coils to prevent the bottom segments from being separated, and
at least one convolution of the coils at the bottom segments being deformed into the central opening to secure the elongated member in the bottom segments.

4,091,510

LOCKING ARRANGEMENT FOR JEWELRY AND THE LIKE

Augustus B. Kinzel, 1738 Castellana Rd., La Jolla, Calif. 92037

Filed Apr. 21, 1977, Ser. No. 789,403
Int. Cl.[2] B44B 19/00
U.S. Cl. 24—230 R 9 Claims



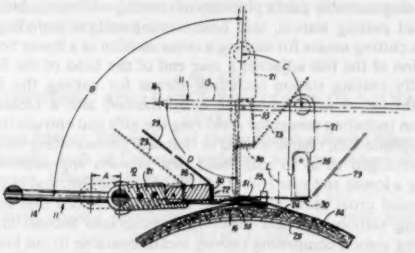
1. A locking arrangement for releasably securing two objects together such as for functioning as a jewelry clasp or the like comprising a set of actuating members movable toward and away from each other in a linear path, resilient means reacting between said actuating members urging said actuating members away from each other, securing means connected to said set of actuating members for securement to one of the objects, a set of locking members spaced from and parallel to said actuating members, said locking members being movable toward and away from each other in a linear path parallel to said linear path of said actuating members, said locking members being movable away from each other to an open position with said locking members spaced apart from each other to permit the other of the two objects to pass therebetween, said locking members being movable toward each other to a closed position to prevent the other of the two objects from passing between said locking members, a set of cross pieces connecting said actuating members to said locking members, each of said cross pieces being connected at one end to one end of one of said actuating members and at its other end to the diametrically opposite end of the remote member of said locking members and at least two of said cross pieces intersecting each other with each end of each of said actuating members and of said locking members being connected to said cross pieces whereby movement of said actuating members toward each other causes said locking members to move away from each other and movement of said actuating members away from each other causes said locking members to move toward each other.

4,091,511

BAND TIGHTENING AND SECURING TOOL

Thomas J. Reddy, 3822 W. 133 St., Cleveland, Ohio 44111

Filed Apr. 25, 1977, Ser. No. 790,586
Int. Cl.[2] A43C 11/00
U.S. Cl. 24—273 10 Claims



1. A band tightening and securing tool comprising a rigid metal frame comprised of a U-shaped bail section having side leg portions extending back from a forward bight portion of relatively short linear extent and flattened in the plane of said frame to constitute the nose end of the tool, said side leg portions having parallel slide rail portions spaced apart a sufficient distance to receive therebetween an operator's hand, and a cross section bridging and tying together the said side leg portions adjacent their rearmost terminal ends, a cross slide member bridging and slidably mounted on the said slide rail portions of said frame for sliding movement therealong, a band clamping draw arm extending forwardly from said slide member medially of the said spaced slide rail portions of the frame and toward the said nose end thereof, and a band clamp head on the forward end of said draw arm for clamping therein a free end portion of the band so as to hold the band in a position extending longitudinally of the frame medially between its said side leg portions and flatwise across the said flattened nose end of the frame.

4,091,512

DEWEAVING APPARATUS FOR TEXTILE TAPES

Phillip Wayne Chambley; Alan Hedley Norris; Robert Doyal Frazier, and Dwain Edwin Cromer, all of Rome, Ga., assignors to Champion International Corporation, Stamford, Conn.

Filed Jun. 15, 1976, Ser. No. 696,305
Int. Cl.[2] D02G 1/00
U.S. Cl. 28—171 8 Claims

1. In a deweaving apparatus for deweaving a fabric tape by

separating and removing a weft filling yarn from a plurality of warp yarns, the improvement comprising:

means for sensing breakage of said warp yarns,

means for sensing breakage of said weft filling yarn,

means for sensing knots and splices in said fabric tape, and

means for stopping the operation of said deweaving apparatus in response to any of said sensed conditions by each of said sensing means,

said means for sensing breakage of said warp yarns including

a reed pivotable in response to sensing an excess mass of warp yarn passing therethrough, said reed having a plurality of upright fingers fixed to a pivotable shaft between any two of which a single warp yarn is passed,

an arm mounted directly on the end of said pivotable shaft, and

said operation stopping means including

switch means for stopping operation of said deweaving apparatus in response to direct contact with said arm upon pivoting of said shaft.

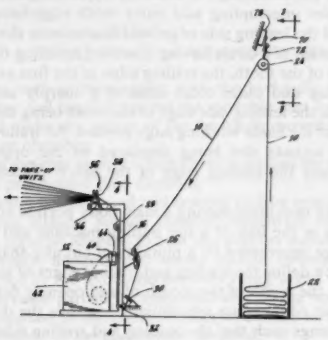
5. In a deweaving apparatus for deweaving a fabric tape by separating and removing a weft filling yarn from a plurality of warp yarns, the improvement comprising:

means for sensing breakage of said warp yarns,

means for sensing breakage of said weft filling yarn,

means for sensing knots and splices in said fabric tape, and

means for stopping the operation of said deweaving apparatus in response to any of said sensed conditions by each of said sensing means,



said means for sensing breakage of said weft filling yarn including

a weft presence detector including a housing having a slot defining a weft threadline plane through which said weft yarn passes, and

said operation stopping means including

means for detecting the presence or absence of said weft yarn in said weft threadline plane and in response to the absence thereof, stopping operation of said deweaving apparatus,

said housing including a pair of diverging upright fingers above said threadline plane for guiding the re-entry of said weft during temporary snags in said weft as it is pulled by said warp yarns.

8. In a deweaving apparatus for deweaving a fabric tape by separating and removing a weft filling yarn from a plurality of warp yarns, the improvement comprising:

means for sensing breakage of said warp yarns,

means for sensing breakage of said weft filling yarn,

means for sensing knots and splices in said fabric tape, and

means for stopping the operation of said deweaving apparatus in response to any of said sensed conditions by each of said sensing means,

said means for sensing knots and splices in said fabric tape including

a roller about which said tape is wound,

a gate including an elongated plate having a bottom edge rotatably mounted above said roller in a predetermined spaced relation to said roller and pivotable in response to sensing a tape between said roller and the bottom edge of said gate of a thickness in excess of said predetermined spaced relationship, and

said operation stopping means including

switch means for stopping operation of said deweaving apparatus in response to direct contact with said plate upon pivoting of said plate by said tape.

4,091,513

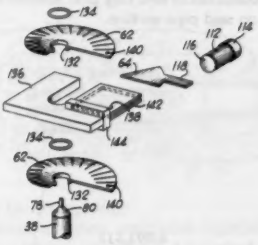
ACCURATE UHF TELEVISION TUNING SYSTEM AND METHOD OF FABRICATING SAME

Alarico A. Valdettaro, Bloomington, Ind., assignor to Sarkes Tarzian, Inc., Bloomington, Ind.

Division of Ser. No. 577,062, May 13, 1975, Pat. No. 4,037,482. This application Apr. 11, 1977, Ser. No. 786,644

Int. Cl.² H01G *7/00*

U.S. Cl. 29—25.41 **8 Claims**



1. A method for concurrently assembling a rotor and a stator to form a tuning element assembly for a UHF television tuner comprising the steps of:

placing an individual rotor plate over a rotor shaft of the tuner;

placing an individual spacer adjacent to and in contact with one face of the rotor plate;

placing an individual stator plate adjacent to and in contact with the spacer so that the spacer serves to separate the individual rotor and stator plates by a predetermined spacing; and

supporting the assembly thus assembled while soldering the rotor plate to the rotor shaft to form a rotor assembly.

4,091,514

SUBSEA MACHINE TOOL

Corroll J. Motes-Conners, and Lawrence E. Satterwhite, both of Houston, Tex., assignors to HydroTech International, Inc., Houston, Tex.

Filed Apr. 30, 1976, Ser. No. 682,158

Int. Cl.² B23K *1/20, 7/04;* B23P *11/00*

U.S. Cl. 29—33 T **6 Claims**

1. In apparatus for performing work on a subsea pipe, the combination comprising:

a support assembly adapted for raising and lowering a body of water;

a remotely operable hydraulic pipe clamp attached to each end of said support assembly for clamping said pipe at two axially-spaced apart positions to support said support assembly such that it is aligned substantially parallel to said pipe;

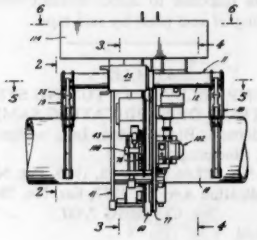
a carriage supported by said support assembly and axially movable with respect thereto;

a split frame supported by said carriage for axial travel therewith and adapted for opening and closing about the section of said pipe intermediate said clamps;

a split ring gear assembly supported by said frame for rotation therewithin and about said pipe section;

power means for rotating said ring gear assembly relative to said frame;

power means for moving said carriage axially relative to said support assembly;



and means connected to said ring gear assembly for performing work on said pipe section.

4,091,515

APPARATUS FOR MOUNTING A CONNECTOR TO COATED WIRES

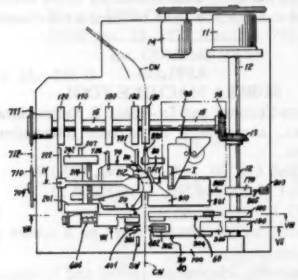
Yasutaka Akiyama, Tachikawa, and Yoshio Iijima, Hiratsuka, both of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka and Japan Aviation Electronics Industries Ltd., Tokyo, both of, Japan

Filed May 17, 1977, Ser. No. 797,749

Claims priority, application Japan, May 20, 1976, 51-58734; May 20, 1976, 51-58735; May 20, 1976, 51-58736; May 10, 1976, 51-52642

Int. Cl.[2] B21B *15/00*

U.S. Cl. 29—33 M **10 Claims**



1. An apparatus for mounting a connector to coated wire, comprising means for gripping the free end side of the coated wire, means for cutting the free end part of said coated wire to a predetermined length, means for removing the coating of said coated wire to a predetermined length from the cut end thereof to expose the conductor, means for mounting an electric terminal to the exposed conductor, means for holding an insulator for the connector, means for guiding the terminal mounted to said coated wire to the front of the connector held by said holding means, and means for inserting said terminal into an opening provided in said insulator for the connector held by said holding means.

4,091,516

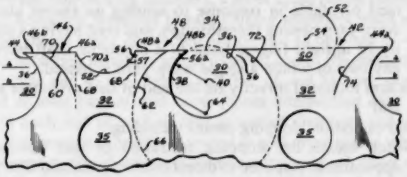
TIRE RASP BLADE HAVING MULTI-CUTTING EDGES

Wayne Emil Jensen, Homewood, and Charles Keith Stanfield, Matteson, both of Ill., assignors to B. & J. Manufacturing Company, Glenwood, Ill.

Filed May 10, 1977, Ser. No. 795,538

Int. Cl.[2] B23D *71/00*; B26D *1/00*

U.S. Cl. 29—79 **20 Claims**



1. A tire rasp blade having a body portion adapted for assembly in the hub of a tire buffing machine and a working edge portion embodying one or more teeth having an outer tooth edge, a leading side edge and a trailing side edge, said leading side edge embodying an arcuate segment of a circle having a center which leads said leading side edge and intersects the outer tooth edge at a sharply acute angle, the outer tooth edge being interrupted by a notch having a trailing edge which intersects the outer edge at a bluntly obtuse angle, and a first arcuate slot interrupting said outer tooth edge between said notch and the leading side edge, said first arcuate slot comprising a segment of a circle having a center preceding the leading side edge of the tooth, the trailing edge of the first arcuate slot intersecting said outer tooth edge at a sharply acute angle therewith, the leading side edge of the tooth being displaced to one side of the blade working edge portion, the trailing edge of the first arcuate slot being displaced to the opposite side thereof, and the trailing edge of the notch placed therebetween.

7. A tire rasp blade having a main body portion adapted for mounting in the hub of a tire buffing machine and a convex outer edge interrupted by a plurality of circular-shaped openings which define the leading and trailing edges of teeth therebetween, the width of the mouth of said opening between the teeth outer edges being substantially less than the diameter of said openings such that the leading and trailing side edges of the teeth defined therebetween are sharply acute to the outer edge of the teeth, the outer edge of the teeth having a notch intermediately disposed between the leading and trailing side edges of the teeth, said notch embodying an arcuate segment of a circle the center of which is above the outer tooth edge such that the lead and trail edges of the notch intersect the outer tooth edge at obtuse angles thereto, a first arcuate slot interrupting the outer edge portion of the tooth between the notch and the leading side edge of the tooth, a second arcuate slot interrupting the outer edge portion of the tooth between the notch and the trailing side edge of the tooth, said first arcuate slot embodying a segment of a circle the center of which leads the leading side edge of the tooth and is spaced below the center of the circle of which the leading side edge of the tooth is a segment, said second arcuate slot embodying a segment of a circle the center of which trails the trailing side edge of the tooth and is spaced below the center of the circle of which the trailing side edge of the tooth is a segment, said arcuate slots terminating below the depth of the notch and so as to leave substantial tooth material between the notch edge and adjacent tooth side edge, the trailing edge of the first arcuate slot being sharply acute to the outer tooth edge, the trailing edge of the second arcuate slot being severely obtuse to the outer tooth edge, the portion of the outer tooth edge between the leading side edge of the tooth and the first arcuate slot being displaced laterally to one side of the tooth, the portion of the outer edge of the tooth between the trailing side edge of the tooth and the second arcuate slot being displaced laterally to the opposite side of the tooth and the portions of the outer tooth edge

between the notch and the arcuate slots being transversely offset to the teeth.

4,091,517

HYDROSTATIC SUPPORT ARRANGEMENT

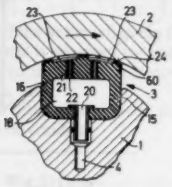
Helmuth Lehmann, Zurich; Rolf Lehmann, Rudolfstetten, and Alfred Christ, Zurich, all of Switzerland, assignors to Escher Wyss Limited, Zurich, Switzerland

Filed May 20, 1977, Ser. No. 798,983

Claims priority, application Switzerland, Jun. 23, 1976, 8000/76

Int. Cl.² B21B *31/32*

U.S. Cl. 29—113 AD **19 Claims**



1. A hydrostatic support device for supporting a movable part, comprising:

a hydraulic pressure chamber;

means for applying hydraulic pressure to the pressure chamber;

a bearing surface cooperating with the hydraulic pressure chamber and bearing against the movable part to be supported under the action of the hydraulic pressure in the pressure chamber;

a support member against which there is applied the pressure of the pressurized fluid medium;

said pressure chamber and said bearing surface comprising a common integral section member formed of an elastomeric material adapted to bear the support member; and

said common integral elastomeric section member when subjected to the hydraulic pressure being urged towards the movable part to be supported and taking up further loads applied to the common integral section member by deformation of the elastomeric material.

4,091,518

METHOD OF REPAIRING WATER TANKS

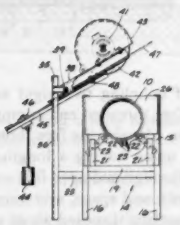
Harry Wayne Rutherford, Box 2316, Gardena, Calif. 90247

Division of Ser. No. 602,826, Aug. 7, 1975, Pat. No. 4,027,374.

This application Feb. 23, 1977, Ser. No. 771,081

Int. Cl.² B23P *7/00*

U.S. Cl. 29—401 F **3 Claims**



1. A method for repairing a cylindrical tank having a concave dish extending into the tank and welded thereto, said method comprising:

removing the weld that holds the concave dish to said tank thereby removing the dish;

placing a new concave dish into the tank so that the overall height of the tank is the same as it was before the concave dish was removed,

welding the new concave dish to the tank in leaktight relationship,

said removing step being performed by:

rotating the tank on its axis,

placing a rotating grinding wheel against the weld, and allowing the grinding wheel to follow freely the contour of the tank.

4,091,519

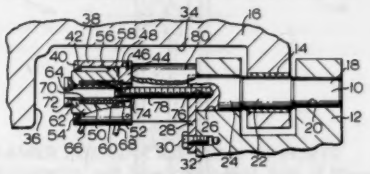
PULLING TOOL WITH ADAPTER FOR USE IN CONFINED SPACES

Virgil R. C. Durgan, Tremont, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 2, 1977, Ser. No. 802,609

Int. Cl.² B23P *19/02*

U.S. Cl. 29—427 **8 Claims**



5. A pulling tool comprising:

first and second members connected together for relative movement between extended and retracted positions;

means for effecting relative movement between said members;

a tube-like adapter mounted on one of said members for relative rotation with respect to the other of said members, said adapter being at least partially internally threaded;

means for precluding relative axial movement between said adapter and said one member in at least one direction; and

means on one of said adapter and said other member for receiving a rotative force to effect relative rotation between said adapter and said other member.

4,091,520

PROCESS FOR MAKING A GASTIGHT PASSAGE

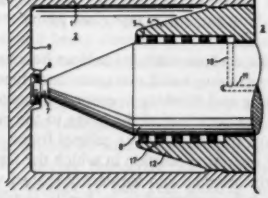
Petrus Leo Clemens Wijnant, 's-Hertogenbosch, and Hendrik Jan Ijlstra, Egmond an der Hoef, both of Netherlands, assignors to Stichting Reactor Centrum Nederland, The Hague, Netherlands

Division of Ser. No. 261,397, Jun. 9, 1972, Pat. No. 3,942,803.

This application Dec. 2, 1975, Ser. No. 636,954

Int. Cl.² B23P *19/00*

U.S. Cl. 29—434 **2 Claims**



1. A method of making a spiral passageway between a rapidly rotating solid of revolution and a tubular support element comprising casting the tubular support element, machining a

cylindrical bore within said element, casting a second element having a continuous spiral rib around its external surface, machining the outer surface of the rib to fit the bore in said support element, fixing said second element within the bore in said support element solely by a contraction fit, machining out that part of said second element which projects inside the rib so as to leave only said spiral rib fixed within said bore and mounting a rotatable body of revolution in said bore in closely relationship with said rib so that said rib and the exposed portion of the wall of the bore together with the surface of said body form at least one continuous spiral passageway.

4,091,521

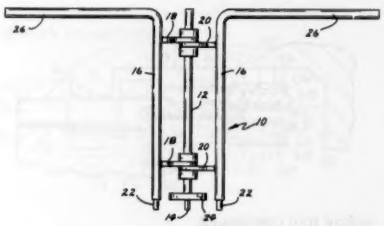
ROD SEAL INSTALLATION TOOL

Edwin S. Dygert, 5325 W. 74th St., Edina, Minn. 55435

Filed Jun. 10, 1977, Ser. No. 805,324

Int. Cl.[2] B23P *11/02*

U.S. Cl. 29—451 **12 Claims**



1. A tool for installing a deformable, resilient ring through an opening in a machine having a substantially lesser inside dimension than the outside dimension of the ring to be installed, said tool including:

A. a center pin;

B. a pair of outside pins in spaced apart, parallel alignment with the center pin;

C. each of the pins having a longitudinal dimension of at least the thickness of the ring to be installed;

D. means for pivoting the outside pins around the center pin while maintaining the parallel alignment with the center pin;

E. the distance between the longitudinal axes of the outside pins and the longitudinal axis of the center pin being such that when the outside pins are moved adjacent each other with the outside pins inside the resilient ring and the center pin outside the resilient ring, the resulting deformed ring and the pins will fit into and through said machine opening.

4,091,522

METHOD OF ASSEMBLING A CABINET FRAME AND DOOR TO PERMIT INTERNALLY COATING SAME

Robert E. Suermann, and Edwin G. Wall, both of Elizabeth City, N.C., assignors to Triangle Pacific Corp. (TriPac), Dallas, Tex.

Filed Dec. 6, 1976, Ser. No. 748,246

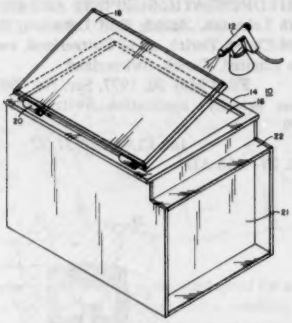
Int. Cl.[2] B23P *3/00, 19/04*

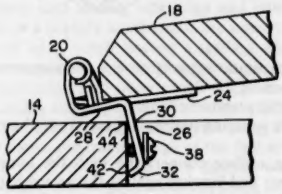
U.S. Cl. 29—460 **2 Claims**

1. The method of assembling a cabinet frame and door therefor with a semi-concealed, wrap-around type hinge, for a surface coating and finishing operation, comprising:

mounting the door leaf of the hinge to the cabinet door;

securing the frame leaf to the cabinet frame in a temporary, coating operation position in which the frame leaf is both angularly oriented and forwardly spaced with respect to the frame as compared to its finally installed position so that with the hinge in its door closed position the door is in a position generally corresponding to a partly open position to facilitate the application of the coating to the inside face of the door and other normally non-exposed surfaces when the door is in a closed position; coating the inside of said door and other normally non-exposed surfaces while said door is in said partially open position, and





then after said coating operation has been completed, shifting said frame leaf to its finally installed position in wrap-around relation to said frame and securing said frame leaf thereat.

4,091,523

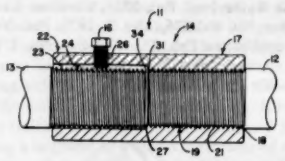
RIGID METAL CONDUIT UNION

Roy C. Riecke, 3303 W. Denison Ave., Davenport, Iowa 52806

Filed Mar. 29, 1977, Ser. No. 782,586

Int. Cl.[2] B23P *19/00;* **F16L** *55/00*

U.S. Cl. 29—526 R **1 Claim**



1. A method of coupling two rigid metal conduits, each conduit having a free threaded end comprising:

disposing a union adjacent the free threaded end of the first conduit, said union having a longitudinal interior space formed therethrough and open first and second ends communicating with said space, said union having a smooth, first interior surface disposed about said space and communicating with said first end, said union having a threaded, second interior surface disposed about said space and communicating with said second end, said first and second interior surfaces meeting between said ends, said union having a bore formed therethrough, through said first surface, and communicating with said space, said union having a set screw disposed in said bore, said first

end being disposed adjacent the free threaded end of the first conduit;

sliding the union over the first conduit, the free threaded end of the first conduit being slidably received by said first interior surface;

threading the union by rotation thereof upon the first conduit, the free threaded end being received by said second interior surface, the first conduit extending through said union flush with said second end;

disposing the free threaded end of the second conduit adjacent said second end;

threading the union by rotation thereof onto the second conduit, the free threaded end of the second conduit being received by said second surface, the free threaded end of the first conduit being disengaged from said second surface;

terminating rotation of the union when the free threaded end of the second conduit is received by said second surface and the free threaded end of the first conduit is received by said first surface; and

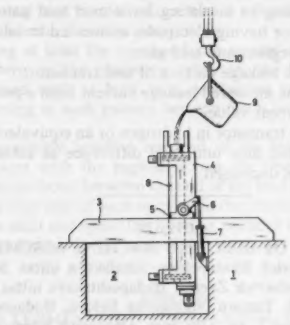
moving said set screw into said bore such that the set screws abuts against the first conduit.

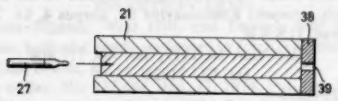
4,091,524

PROCESS FOR PRODUCING PIPE BLOOMS

Friedrich Kocks, deceased, late of Dusseldorf, Germany, and by Jutta Kocks, heir, Wermelskirchen, Germany, assignors to Ali Bindernagel, Dusseldorf-Gerresheim, Germany

Continuation of Ser. No. 596,259, Jul. 16, 1975, abandoned.
This application Apr. 13, 1977, Ser. No. 787,027
Claims priority, application Germany, Jul. 19, 1974, 2434850
Int. Cl.[2] B22D *13/10, 45/00*
U.S. Cl. 29—527.7 **10 Claims**





1. A process for producing a long tubular bloom having a length to diameter ratio in excess of 20:1 comprising the steps of:

(a) pouring molten material into a chill mould whose longitudinal axis is transverse to the horizontal and having a mould opening with a length to diameter ratio in excess of 20:1;

(b) sealing the chill mould immediately after pouring the molten material is completed;

(c) tilting the chill mould to a generally horizontal axial position as soon as sealed;

(d) rotating the mould about its longitudinal axis from a time not later than the time the mould assumes the horizontal axial position until a generally uniform peripheral wall of substantially solidified metal has formed having an axial core which is at least partially viscous;

(e) inserting at least one mandrel into the material in the chill mould along the longitudinal axis of said mould while the material along said axis is at least partially viscous, said mandrel being in contact with the metal throughout its inserted length;

(f) guiding said mandrel during insertion solely by the substantially solidified metal of the peripheral wall surrounding the axial portion;

(g) transferring the material from the mould along with the axial mandrel to a forming operation;

(h) processing the material around the mandrel to form a tube; and

(i) removing the mandrel from the completed tube.

4,091,525

REAMER FOR FINE REAMING OF PORTS

Czeslaw Karasiewicz, and Janusz Seliborski, both of Warsaw, Poland, assignors to Kombinat Maszyn Budowlanych "Bumar" Warszawskie Zaklady Maszyn Budowlanych IM.L. Warynskiego, Warsaw, Poland

Filed Jun. 16, 1976, Ser. No. 696,818
Claims priority, application Poland, Jun. 20, 1975, 181428
Int. Cl.[2] B24B *39/02*
U.S. Cl. 407—1 **6 Claims**

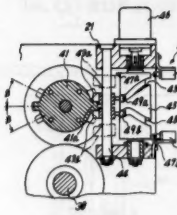
1. A reamer rotatable about its axis for fine reaming of a port comprising a working portion, a front guiding portion for guiding said reamer into said port, and a rear guiding portion, said working portion being connected to said front and rear guiding portions intermediate thereof so that said working portion enters said port after said front guiding portion and before said rear guiding portion, said working portion comprising cutting blades, said rear guiding portion comprising at least three smoothing inserts in said rear guiding portion, said smoothing inserts having respective outer edges extending beyond the outer surface of said rear guiding portion, said outer edges of said smoothing inserts and said cutting blades lying on the lateral surface of a right circular cone whose generatrix is inclined towards said front guiding portion at a relief angle greater than 0°0′ and less than 0°5′ with respect to the rotational axis of said reamer.

4,091,526

MACHINE TOOL WITH AN AUTOMATIC TOOL EXCHANGER

Tohru Nakaso, Nagoya; Manabu Hosokawa, Chiryu; Kenzi Nomura, Aichi, and Tatsuya Hikosaka, Toyohashi, all of Japan, assignors to Toyoda Machine Works, Ltd., Japan

Filed Dec. 29, 1976, Ser. No. 755,574
Claims priority, application Japan, Jan. 29, 1976, 51-9029
Int. Cl.[2] B23Q 3/157
U.S. Cl. 29—568 11 Claims



1. In a machine tool with an automatic tool exchanger having a tool spindle rotatably supported and capable of receiving a tool at one end thereof, a tool magazine for removably storing a plurality of tools, and exchange means for exchanging tools between said tool spindle and said tool magazine, the improvement comprising:

a drive key protruding from said one end of said tool spindle and engageable, with a predetermined play in its rotational direction, with a key-way formed on each of said tools;

a plurality of detents provided on said tool magazine in the same angular relationship with one another and respectively engageable with said key-ways of said tools, each of said detents having almost the same width as that of said drive key in the rotational direction of each tool;

coarse indexing means for indexing said tool spindle within a predetermined angular extent after a machining operation; and

fine indexing means comprising

means provided on said tool spindle for integral rotation therewith,

a movable cam member operably supported and being drivingly connectable with said means on said tool spindle when the same is indexed within said predetermined angular extent, said cam member being provided with a first cam segment cooperating with said means on said tool spindle for indexing said tool spindle to a predetermined angular position when a first movement of said cam member is effected and a second cam segment cooperating with said means on said tool spindle for rotating said tool spindle a little from said predetermined angular position when a second movement of said cam member is effected, and

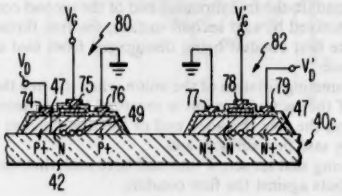
cam drive means connected to said cam member for generating said first movement of said cam member after said tool spindle is indexed within said angular extent by said coarse indexing means and for generating said second movement of said cam member after a fresh tool is inserted into said tool spindle by said exchange means.

4,091,527

METHOD FOR ADJUSTING THE LEAKAGE CURRENT OF SILICON-ON-SAPPHIRE INSULATED GATE FIELD EFFECT TRANSISTORS

Alvin Malcolm Goodman, Princeton, and Charles Edward Weitzel, Plainsboro, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 7, 1977, Ser. No. 775,151
Int. Cl.[2] H01L 11/14
U.S. Cl. 29—571 12 Claims



1. A method for making an insulated gate field effect P channel transistor having a reduced leakage current, in a body of silicon semiconductor of a first conductivity type having first and second major surfaces, the second major surface being on a sapphire substrate, comprising the steps of:

forming a first oxide layer from said body of semiconductor on said first major surface;

removing said first oxide layer;

then forming in said body of semiconductor a field effect transistor having a leakage current with a gate region between a source region and a drain region, a second oxide forming an insulating layer over said gate region, the transistor having electrodes connected to said source and drain regions and said gate;

measuring the leakage current of said transistor;

subtracting the measured leakage current from a preselected leakage current value;

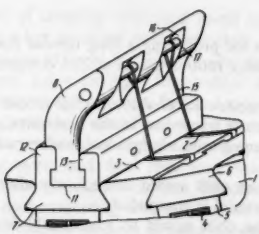
annealing the transistor in hydrogen or an equivalent gas for a preselected time until said difference as subsequently measured is decreased.

4,091,528

METHOD OF ELECTRIC MACHINE ASSEMBLY

Garri Mikhailovich Khutoretsky, Altaiskaya ulitsa 20, kv. 5; Anatoly Timofeevich Zverev, Budapeshtskaya ulitsa 31, korpus 1, kv. 58; Tamara Nikolaevna Belova, Budapeshtskaya ulitsa 3, korpus 2, kv. 138; Jury Alexeevich Bazarov, Budapeshtskaya ulitsa 15, korpus 2, kv. 11, and Elrikh Iosifovich Gurevich, prospekt Kosmonavtov 50, korpus 4, kv. 72, all of Leningrad, U.S.S.R.

Filed Mar. 14, 1977, Ser. No. 777,404
Int. Cl.[2] H02K 15/00
U.S. Cl. 29—596 3 Claims



1. A method of assembling an electric machine, comprising the steps of:

passing at least two ropes through radial ventilating ducts arranged within slots of a core of a stator;

attaching one end of each of said ropes to the top of resilient inserts, said inserts being mounted on slot wedges extending into an air gap defined by said stator and a rotor;

bending said resilient inserts toward said core of said stator, said slots of said core having a winding disposed therein and retained therein by said slot wedges; and

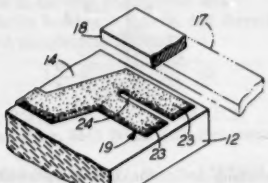
placing said rotor within said stator of the electric machine while said inserts are inclined toward said core.

4,091,529

METHOD OF FORMING SUBSTRATE TERMINAL AREAS FOR BONDED LEADS

Vincent Joseph Zaleckas, Union, N.J., assignor to Western Electric Co., Inc., New York, N.Y.

Division of Ser. No. 624,136, Oct. 20, 1975, Pat. No. 4,034,149.
This application Feb. 23, 1977, Ser. No. 771,132
Int. Cl.[2] H01R *43/02*; H05K *1/04*
U.S. Cl. 29—628 **2 Claims**



1. In a method of making electronic devices having at least one terminal lead bonded at one end to a bond site on an insulating substrate, the steps comprising:

forming at least the one bond site as part of a conductive pattern on the insulating substrate, the bond site being formed with at least two conductive regions and one opening in such pattern between each two such regions; and

compressively bonding one end of the lead brought into contact with the regions across the opening to form a separate bond between the end of the lead and each region on either side of such opening in the conductive pattern so that such end spans the opening without being bonded to the substrate in the area of the opening.

4,091,530

FIELD TERMINATION TOOL HAVING CONNECTOR REFERENCE PLANE APPARATUS AND HINGE INSERTION ARMS

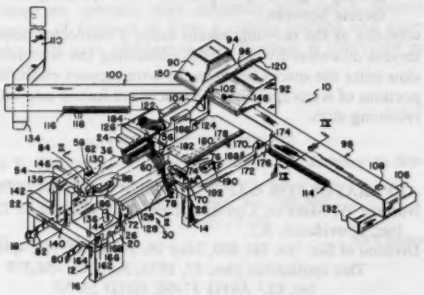
John Peter Nijman, West Hill, and Terence Neil Patterson, Toronto, both of Canada, assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Division of Ser. No. 432,484, Jan. 11, 1974, Pat. No. 3,952,392.
This application Feb. 6, 1976, Ser. No. 655,925
Int. Cl.[2] H01R *43/04*
U.S. Cl. 29—749 **20 Claims**

1. In a terminating apparatus of the type wherein insulated conductors are electrically and mechanically connected to respective contact portions of an electrical connector which is supported on a connector support, the improvement therein comprising:

connector holding means for holding the connector including movably mounted first means operable for providing access to said support and for releasably engaging the connector immediately adjacent the contact portions; and second means urging the connector into engagement with said first means to establish a reference plane through the connector at the point of engagement of the connector and said first means,

said first means including a pair of holding means movably mounted on opposite sides of the connector support for movement toward and away from the connector and each having a hook portion for engaging the connector, and



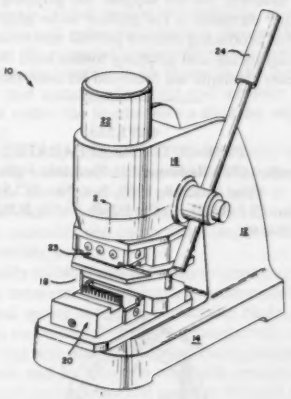
said second means including spring means for receiving the connector thereon and urging the connector toward said hook portions of said holding members.

4,091,531

TOOL FOR SIMULTANEOUSLY STAKING A PLURALITY OF WIRES INTO AN ELECTRICAL CONNECTOR

Daniel Baker Grubb, Hummelstown; William Ludlow Schumacher, Camp Hill, and Robert Volinskie, Hershey, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 5, 1976, Ser. No. 683,595
Int. Cl.[2] H01R *43/04*
U.S. Cl. 29—749 **7 Claims**



1. A tool for simultaneously staking a plurality of parallel wires into a connector having a plurality of contact members of the type having blades with wire-receiving slots extending outwardly from one end of the connector housing, said tool comprising:

a. frame means providing a base and an upper support member in vertical alignment with the base;

b. movable means positioned in the upper support member for vertical reciprocal movement and having a downwardly facing surface;

c. actuating means for moving the movable means;

d. a connector support plate having depending posts for laterally restraining said blades as wires are forced into the wire-receiving slots located therein;

e. at least two wire support means attached to the base and

facing upwardly toward the connector support plate, said wire support means positioned one behind the other with a space between, said wire support means being for supporting a plurality of parallel wires spanning said space therein between,

whereby as the movable means move a connector positioned therein downwardly the blades containing the wire-receiving slots enter the spaces between the wire support means and the portions of wires spanning the spaces are forced into the wire-receiving slots.

4,091,532

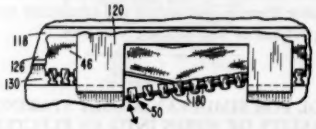
APPARATUS FOR GAPPING SLIDE FASTENER CHAIN

Norman W. MacFee, Conneaut Lake, Pa., assignor to Textron Inc., Providence, R.I.

Division of Ser. No. 581,658, May 28, 1975, Pat. No. 4,019,240. This application Dec. 27, 1976, Ser. No. 754,375

Int. Cl.[2] A41H *37/06*; B21D *53/50*

U.S. Cl. 29—770 **5 Claims**



1. An apparatus for gapping a slide fastener stringer having a continuous row of fastener elements secured to an edge of a tape of the stringer, the apparatus comprising

a support,

means mounted on the support for holding the tape adjacent to a portion of the stringer to be gapped,

means mounted on the support for gripping a plurality of fastener elements in the portion to be gapped, and

means for producing relative pivotal movement between the holding means and gripping means such that the gripped fastener elements are removed seriatim from the tape.

4,091,533

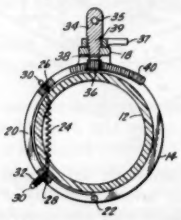
PIPE-CUTTING APPARATUS

Jon Saumell, 16769 Redwood St., Fountain Valley, Calif. 92708

Filed Jun. 18, 1975, Ser. No. 587,910

Int. Cl.[2] B23D *21/06*; B26B *27/00*; B26D *3/16*

U.S. Cl. 30—95 **1 Claim**



1. A manual pipe-cutting apparatus for use in cutting plastic, rubber and other non-metallic pipes or thin-wall metal tubing comprising:

a annular-support body adapted to be positioned over a pipe to be cut;

a support guide means formed as an integral part of said support body and extending forward thereof for engagement with said pipe;

an arcuate cutting arm pivotably attached to said annular support body;

pivotal means connecting said arm to said body;

serated wire mounted to said cutting arm for direct engagement with said pipe;

a key rotatably mounted to said support body having a pinion gear formed as part of said key;

a gear rack disposed along one side of said cutting arm for engagement with said pinion gear; and

locking means mounted on said key wherein said cutting arm is locked into place.

4,091,534

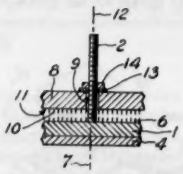
NUT SHELLING DEVICE

Gordon Ayotte, St. Leonard, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed May 12, 1977, Ser. No. 796,158

Int. Cl.[2] A47J *43/26*; B26B *17/00*

U.S. Cl. 30—120.2 **1 Claim**



1. A nut shelling device for shelling a plurality of nuts simultaneously, said shelling device comprising

a circular base plate having a predetermined diameter, an elongated bolt coaxially extending from a surface thereof and a circumference;

a cylindrical side affixed to the base plate around the circumference thereof;

a plurality of pointed nail-like members extending from the surface of the base plate in spaced mutual relation substantially parallel to the axis of said base plate;

a circular cover plate having a coaxial bore formed therethrough and a diameter slightly smaller than the predetermined diameter;

a plurality of pointed nail-like members extending from a surface of the cover plate in spaced mutual relation substantially parallel to the axis of said cover plate; and

releasable securing means for releasably securing the cover plate to the base plate with the nail-like members of each pointed toward the other with the points spaced from each other with the cover plate coaxially positioned on the base plate with the bolt passing through the bore whereby when the cover plate is secured to the base plate with a plurality of nuts placed on the base plate and the cover plate is rotated back and forth relative to the base plate a plurality of times, most of the nuts are shelled.

4,091,535

SHINGLE STRIPPER

James F. Lehrter, Reading, Ohio, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jun. 23, 1977, Ser. No. 809,375

Int. Cl.[2] A47L *11/12, 13/02*

U.S. Cl. 30—169 **2 Claims**

1. A shingle stripper for stripping shingles off a roof having a ridge and a gutter edge, said shingle stripper comprising

guide means removably affixed to a roof and including a cable extending between the ridge and the gutter edge of the roof;

a housing having an open forward end and a closed rear end;

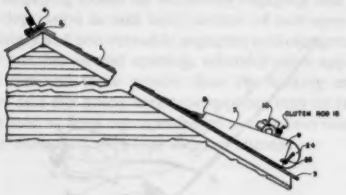
an internal combustion motor mounted in the housing;

a pair of shafts rotatably mounted in the housing and coupled to and rotated by the motor;

a cable drum affixed to and rotatable with the drive shaft

having the cable of the guide means wound thereon in a manner whereby as the drive shaft rotates the cable is wound on the cable drum and the housing moves up the roof from the gutter edge to the ridge;

clutch means for decoupling the motor from the drive shaft when the housing reaches the guide means at the ridge;



cutting means in the housing at the forward end thereof coupled to the motor and driven thereby for cutting the nails of the shingles as the housing is moved up the roof whereby the severed shingles fall into the housing and accumulate at the rear end thereof; and

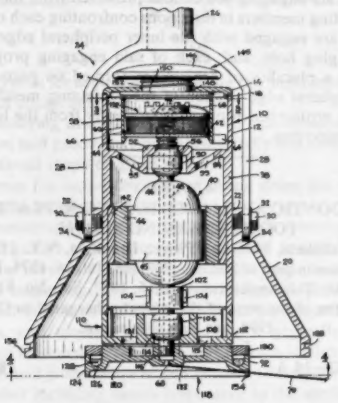
trap means in the housing at the rear end thereof for removing severed shingles therefrom.

4,091,536

ROTARY CUTTING DEVICE

Mark R. Bartholomew, 8641 Willis #32, Panorama City, Calif. 91402

Filed Jan. 10, 1977, Ser. No. 757,997
Int. Cl.[2] A01D *35/26*; A01G *3/06*
U.S. Cl. 30—276 **9 Claims**



1. A rotary cutting apparatus for cutting vegitation with a filament comprising:

a housing;

motive means mounted within said housing for rotatably moving the filament, said motive means including a hollow shaft having first and second ends, said shaft receiving the filament through said hollow portion thereof;

a guide disc connected to said first end of said shaft for directing the filament from a generally vertical disposition to a generally horizontal dispostion whereby a cutting portion of the filament is formed;

a bobbin assembly mounted within said housing and connected to said second end of said shaft, said assembly including a filament spool portion for storing a coil of filament and an upper integral locking portion for restraining the filament, the filament passing from said spool portion upwardly to said locking portion and then downwardly through said hollow shaft, said assembly being spring mounted and movable vertically between locking and unlocking positions; and

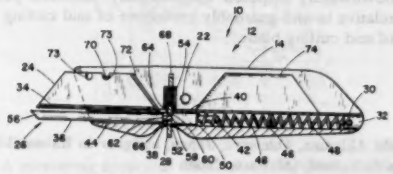
pushbutton means mounted to said housing for moving said bobbin assembly vertically between said locking and unlocking positions whereby upon depression of said pushbutton an operator may manually pull out a desired amount of filament to form a cutting portion and upon release of said pushbutton said filament is restrained in position.

4,091,537

SAFETY UTILITY KNIFE

Wayne E. Stevenson, Jr., Mechanicsburg, Pa., assignor to Stevenson Machine Shop, Mechanicsburg, Pa.

Filed Apr. 26, 1977, Ser. No. 790,960
Int. Cl.[2] B26B *29/00*
U.S. Cl. 30—286 **10 Claims**



1. A safety utility knife comprised of a separable elongated shaped two-piece handle adapted to positionally secure and retain therein a replaceable cutting blade having a cutting edge said two-piece handle also being further provided with a spare cutting blade storage recess therein, which is old, characterized by:

(a). an elongated geometrically configured spiral spring activated retractable blade guard cutting edge rod member provided with an insertably assembled first compression-extension spiral spring to movably communicate compressive and extensive coaction therewith, said rod member in the extended position being adjacently, downwardly disposed with respect to and in the same general plane as said cutting edge, said rod member having an inner end within the handle with a shoulder adjacent said inner end,

(b). a mechanically cooperative geometrically configured spiral spring activated blade guard cutting edge rod member release and lock trigger provided with an insertably assembled second compression-extension spiral spring to movably communicate compressive and extensive coaction therewith, and

(c). a manually initiated mechanically cooperative alignment coaction between said elongated geometrically configured spiral spring activated retractable blade guard cutting edge rod member and said geometrically configured spiral spring activated blade guard cutting edge rod member release and lock trigger to enable retraction of said blade guard cutting edge rod member through an opening in said blade guard cutting edge rod member release and lock trigger into a longitudinally disposed axially aligned first spiral spring tubular opening within said handle against the coactive compressive force of said first spiral spring retained therein to thereby expose the cutting edge of said cutting blade for severing service upon a manually imparted finger-force depression of said blade guard cutting edge rod member release and lock trigger against the coactive compressive force of said second spiral spring when said knife is employed in combination with a concurrent manually imparted use application pressure directed by way of said handle towards a surface to be severed, wherein, following which, upon release of said manually imparted use application pressure to said handle, said manually initiated mechanically cooperative alignment coaction being coactively cooperative reversely

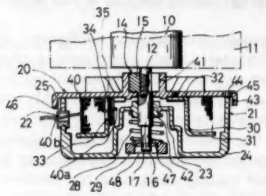
thereby enables automatic extension of said blade guard cutting edge rod member outwardly of said longitudinally disposed axially aligned first spiral spring tubular opening through said opening in said blade guard cutting edge rod member release and lock trigger under the coactive extensive force of said first spiral spring to position said blade guard cutting edge rod member in protective cover of the cutting edge of said cutting blade, and upon a subsequent release of said manually imparted finger-force depression upon said blade guard cutting edge rod member release and lock trigger thereby also enables said blade guard cutting edge rod member release and lock trigger to automatically extend under the coactive extensive force of said second spiral spring and thereupon cause a positive mechanical engagement locking of said blade guard cutting edge rod member by means of said trigger opening engaging said shoulder on said rod member in a close proximity downwardly disposed longitudinally extended position relative to and guardably protective of said cutting edge of said cutting blade.

4,091,538

MOWING APPARATUS

Satoshi Akiyama, Odawara, Japan, assignor to Kabushiki Kaisha Shikutani, Odawara, Japan

Filed Mar. 31, 1977, Ser. No. 783,288
Claims priority, application Japan, Jul. 21, 1976, 51-8695
Int. Cl.[2] A01G *3/06*
U.S. Cl. 30—276 **8 Claims**



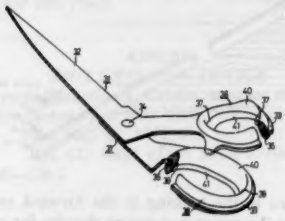
1. A cutter assembly for a mowing machine having a power-driven shaft, which assembly comprises a pair of members for mounting coaxially on the power-driven shaft on the mower, one of the members having a cylindrical portion secured to a disc portion of a greater diameter and the other member having a disc portion with an upstanding peripheral wall portion of a diameter greater than that of the cylindrical portion such that the two members when fitted together coaxially define an annular chamber for a coiled cutting string, the cylindrical portion having connecting means to connect the end of a cutting string thereto and the peripheral wall portion having a guide port through which the free end portion of the cutting string passes outwardly to form a cutting flail, the connecting means having a slot formed in a radially, inwardly recessed portion of the cylindrical portion, said radially inwardly recessed portion having a partially thick wall portion formed with a hollow window in which a thin plate is inserted, the thin plate being formed with the slot with an acute apex towards the peripheral direction, the thick wall portion having on the side pointed by the apex an outer bevelled surface and on the other side an inner guide plate projecting behind the slot so as both to prevent the bent of the end portion of the string from bulging out of the recessed portion and to guide the end portion of the string to turn behind the slot, means coupling the two members together for simultaneous rotation releasable to allow relative rotation by axial separation of the two members and resilient biassing means urging the two members together to the coupled disposition.

4,091,539

SCISSORS

Tokuji Watanabe, Yokkaichi, Japan, assignor to Hayashi Cutlery Company, Limited, Japan

Filed Apr. 22, 1977, Ser. No. 789,867
Int. Cl.[2] B26B *13/20*
U.S. Cl. 30—341 **5 Claims**



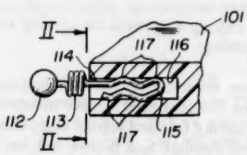
1. In a scissors having a pair of scissor pieces, each with a blade portion and a holding portion extending from the blade portion and having a finger-hanging hole, said blade portion and holding portion being integrally formed by press molding, a pin connecting said scissor pieces substantially at central portions thereof so that the scissoring operation is possible, a pair of annular protecting members fitted in the finger-hanging hole from both the sides of the holding portion of each scissor piece so that the protecting members cover the inner peripheral edge of the finger-hanging hole and they co-operatively form a continuous inner peripheral wall portion, and engaging means for holding said protecting members into each finger-hanging hole, the improvement therein, wherein, said engaging means are engaging projections projected from the pair of the protecting members in directions confronting each other so that they are engaged with the inner peripheral edge of the finger-hanging hole, and, each of said engaging projections comprises a plurality of projections formed on parts of the inner peripheral edge portion of the protecting member and anchoring projections projected outwardly from the top ends of said projections.

4,091,540

ORTHODONTIC APPLIANCE HAVING REPLACEABLE TOOTH ENGAGING MEANS

Melvin Wallshein, 8645 Bay Pkwy., Brooklyn, N.Y. 11214

Continuation-in-part of Ser. No. 708,305, Jul. 26, 1976, Pat. No. 4,054,966. This application Jul. 15, 1977, Ser. No. 816,138
The portion of the term of this patent subsequent to Oct. 25, 1994, has been disclaimed.
Int. Cl.[2] A61C *7/00*
U.S. Cl. 32—14 A **18 Claims**



1. An orthodontic appliance comprising:
a first member adapted to be located in a mouth and in proximity to a tooth, said first member having means defining at least one opening therein, said opening having at least one depression in an inner surface thereof; and
an elongated wire-type member having at least one end removably insertable in said at least one opening of said first member, and further including means for cooperatively coupling same to at least one tooth;

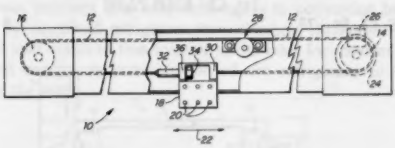
said at least one end of said elongated member having a main portion and a bent back portion, at least a portion of said one end of said elongated member being resilient in a direction substantially perpendicular to the length of said elongated member, at least one of said main portion and bent back portion having a contoured releasable cooperative engaging means for releasably engaging said at least one depression in said inner surface of said opening for lockingly and non-rotatably engaging said elongated wire-type member in said opening, whereby upon application of a removal force greater than the locking engaging force, said elongated wire-type member may be removed from said at least one opening to permit insertion of another elongated wire-type member therein.

4,091,541

LINEAR MEASURING APPARATUS

James J. DiCiaccio, Somerville, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Oct. 7, 1974, Ser. No. 512,811
Int. Cl.[2] B23Q *17/02*; G01B *3/00*
U.S. Cl. 33—125 R **3 Claims**



1. A system for accurately measuring the linear movement of an object comprising:

a. a metering drum having a groove around its circumference, said groove having a substantially semicircular cross sectional shape of given radius;

b. means for supporting said metering drum for rotational movement about a drum axis;

c. a measuring cable supported around said metering drum in said groove and adapted to be coupled to said object for linear movement therewith such that linear movement of said measuring cable will result in a corresponding rotational movement of said metering drum about said drum aixs, said measuring cable having a generally circular cross sectional shape the radius of which is slightly larger than said given radius of said groove, said measuring cable further including means responsive to the application of tension thereto for slightly changing the cross sectional shape thereof;

d. means for applying tension to said measuring cable for causing said cable to slightly change its cross sectional shape and flow into said groove to form a very tight frictional bond between said cable and said groove, said tension applying means including means for maintaining a substantially constant, uniform tension on said cable for maintaining the cross sectional shape of said cable in said groove substantially constant and uniform at all times whereby the linear movement of said cable and, hence, of said object, can be very accurately measured by measurement of the rotational movement of said metering drum;

e. means for measuring the rotational movement of said metering drum about said drum axis; and

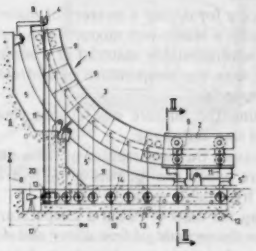
f. wherein said metering drum includes means for adjusting the radius of said metering drum to adjust the scale factor of the system.

4,091,542

MEASURING APPARATUS FOR DETERMINING THE POSITION OF THE ROLLER APRON OF A CONTINUOUS CASTING INSTALLATION

Markus Schmid, Zürich, and Heinrich Marti, Forch, both of Switzerland, assignors to Concast AG, Zürich, Switzerland

Filed Apr. 29, 1977, Ser. No. 792,233
Claims priority, application Switzerland, May 7, 1976, 5736/76
Int. Cl.[2] G01B *5/24*; B22D *11/10*
U.S. Cl. 33—333 **11 Claims**



11. A measuring apparatus for determining the position of a strand guide of a continuous casting installation, comprising:

at least one strand guide;

means for supporting said strand guide with respect to a base defining a substantially horizontal measuring plane;

said strand guide containing coordinate-measuring points at which there are means for mounting plumb lines for projecting the position of the measuring points along a substantially vertical axis into said substantially horizontal measuring plane;

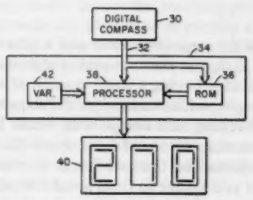
said plumb lines constituting calibrated plumb lines which are applied along the strand guide at least at given ones of the coordinate-measuring points and each have a length corresponding to the desired distance between the related measuring point and the measuring plane.

4,091,543

AUTOMATIC MAGNETIC COMPASS CORRECTION

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Filed Jun. 17, 1976, Ser. No. 697,194
Int. Cl.[2] G01C *17/38*
U.S. Cl. 33—356 **8 Claims**



1. Apparatus for providing a deviation-corrected output signal representative of an actual compass heading comprising:

a magnetic compass providing a digital output signal representative of an indicated compass heading;

means for storing deviation-corrected signals representative of the actual heading of the compass for each of a plurality of different indicated headings

and for providing the stored deviation-corrected signal corresponding with the indicated compass heading in response to the output signal from the compass; and

means responsive to the provided deviation-corrected signal for producing a deviation-corrected output signal representative of the actual compass heading.

4,091,544

DRYING PROCESS

James Peyton Hutchins, Springfield Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 11, 1977, Ser. No. 768,013
Int. Cl.[2] F26B *5/00*
U.S. Cl. 34—9 **7 Claims**

1. A process for drying a mixture of materials comprising:

A. Forming a water-wet mixture of a hydratable material and a nonhydratable material at a temperature which is higher than the temperature of hydration of the hydratable material;

B. Forming the mixture of (A) into smaller units of the desired size and shape;

C. Decreasing the temperature of the units of (B) to a temperature which is at or below the hydration temperature of the hydratable material; and

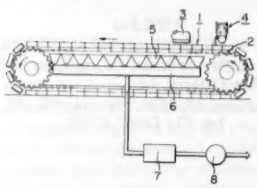
D. Drying the units of (C) at a temperature high enough to remove the amount of free water and water of hydration which is desired but not high enough to cause the units to soften and stick together.

4,091,545

METHOD FOR REMOVING WATER AND GREASE DEPOSIT FROM ROLLING MILL SLUDGE

Tetsuo Izawa, Yokohama; Shuji Kajikawa, Zushi; Koji Satomi, Tokyo; Koichiro Nakano, Yokohama; Shinichi Kurosawa, Kawasaki; Keitaro Hirai, Yokohama, and Yuichi Tsukada, Tokyo, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 662,617, Mar. 1, 1976, abandoned.
This application Jul. 8, 1977, Ser. No. 813,808
Claims priority, application Japan, Mar. 8, 1975, 50-27628
Int. Cl.[2] F26B *3/18*
U.S. Cl. 34—9 **7 Claims**



1. A method for removing water and a grease deposit from a rolling mill sludge to convert said sludge into a sinter raw material, said sludge having a water content of at least about 20 percent by weight, which comprises the sequence of steps of:

heating said rolling mill sludge with waste heat of a sinter cooler at a temperature of from about 120° to about 200° C. for a period of time sufficient to reduce the water content of said sludge to from about 1 to about 10 percent by weight, thereby reducing the viscosity thereof so as to ensure a smooth supply of said sludge; and

feeding said water-reduced sludge onto hot sinter at at least one sintering operation stage consisting of (i) a sinter discharge section, (ii) an entry section of a sinter cooler, (iii) a belt conveyor for fines return provided adjacent a hot screen therein, and (iv) a return hopper of a sintering apparatus for said operation, heat of the sinter produced in said operation substantially completely removing the water and the grease deposit of said sludge.

5. A method for removing water and a grease deposit from a rolling mill sludge to convert said sludge into a sinter raw material, said sludge having a water content of at least about 20 percent by weight, which comprises the sequence of steps of:

mixing said rolling mill sludge and a mill scale having a water content of up to 6 percent by weight to reduce the water content of said sludge to from about 1 to about 10 percent by weight, thereby reducing the viscosity of said sludge so as to ensure a smooth supply of said sludge; and

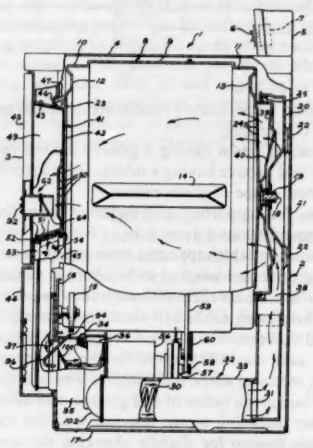
feeding said water-reduced sludge onto hot sinter at at least one sintering operation stage consisting of (i) a sinter discharge section, (ii) an entry section of a sinter cooler, (iii) a belt conveyor for fines return provided adjacent a hot screen therein, and (iv) a return hopper of a sintering apparatus for said operation, heat of the sinter produced in said operation substantially completely removing the water and the grease deposit of said sludge.

4,091,546

LAUNDRY MACHINE AIR VENT

John Bochan, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Mar. 4, 1977, Ser. No. 774,395
Int. Cl.[2] F26B *21/06*
U.S. Cl. 34—73 **8 Claims**



1. In a laundry machine having a horizontal axis rotatable drum and a door for access into the drum, an air vent comprising:

a duct having one end in air flow communication with the interior of the drum and the opposite end in air flow communication with air outside the machine,

a flexible flap within the duct having one end free and movable from a vertical first position to a second position, and the opposite end secured to the duct, said flap having a dimension less than the inside lateral cross section of the duct, and

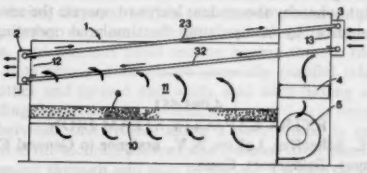
a partition spaced from the free end of the flap when the flap is in the first position, said partition having an opening smaller than the flap, whereby the opening is covered when the machine is in operation and the flap is in the second position thus preventing air from passing through the duct.

4,091,547

HEAT RECOVERY MEANS FOR DRYING APPARATUS

Barry Rupert Leigh, Rugby, England, assignor to Josglade Limited, Coventry, England

Filed Mar. 28, 1977, Ser. No. 782,290
Claims priority, application United Kingdom, Mar. 31, 1976, 12944/76
Int. Cl.² F26B 19/00
U.S. Cl. 34—86 6 Claims



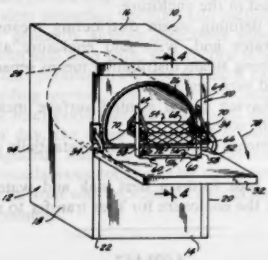
1. Heat recovery means in combination with drying apparatus such as kiln comprising a chamber for receiving supported therein material such as grain to be dried and having an inlet for air and an outlet for moist air; means for heating and introducing air into the chamber; a heat exchanger located at the moist air outlet of the chamber for contact with exhaust moist air therefrom; a further heat exchanger located at the air inlet for contact of incoming air therewith; and pipework connecting said heat exchangers in circuit for the circulation of a refrigerant between said heat exchangers in conveying heat energy by vaporised refrigerant from the heat exchanger located at said outlet to that located at the inlet for transfer of said heat energy on condensation of the refrigerant to air entering the inlet.

4,091,548

DOOR MOUNTED STATIONARY DRYING RACK

Thomas Edward Daily, Herrin, Ill., assignor to Fedders Corporation, Edison, N.J.

Filed Nov. 10, 1976, Ser. No. 740,556
Int. Cl.² F26B 9/00
U.S. Cl. 34—133 9 Claims



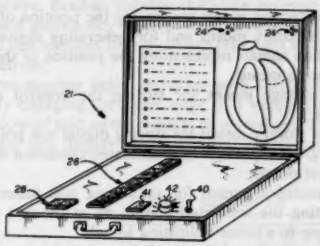
1. In a dryer construction of the type having a rotatable drum within a housing for tumble drying articles received therein, wherein the housing has an access door for the drum; a rack movable into said drum for maintaining selected articles stationary during a cycle of operation of the dryer; said rack comprising a basket having an open top for receiving articles therein; and bracket means adapted to support said basket on said door and in spaced relationship thereto, whereby said basket is received into the interior of the drum when the door is closed, said bracket means comprising pivot means for pivotally supporting said basket, whereby said basket pivots as the door is moved between open and closed positions to maintain said open top uppermost.

4,091,549

PACEMAKER TRAINING AID

Jack Driller, 281 Kenilworth Rd.; David Porter, 714 Howard Rd., both of Ridgewood, N.J. 07450, and William Henriksen, 1474 Motor Pkwy., Hauppauge, N.Y. 11787

Filed Jul. 11, 1977, Ser. No. 814,406
Int. Cl.² G09B 23/28
U.S. Cl. 35—17 5 Claims



1. A teaching device, for illustrating the operation of a heart by illuminating various predetermined portions, in a predetermined sequence, of an illustration of a human heart, to display the sequence of command signals received by those portions of the heart for control of their normal or abnormal operation and the effect that a pacemaker has on the sequence of command signals received by the abnormal heart, comprising:

an illustration of a heart indicating various heart elements including at least the four major chambers, atrioventricular and sinoatrial nodes, proximal and distal portions of the common bundle of His, left and right bundle branches and left and right side Purkinje fibers,

light emitting means for separately illuminating each one of said illustrated elements,

control means selectively operable to sequentially illuminate each of said light emitting means, and consequently said elements, in at least a first predetermined illumination sequence and at least at a first predetermined rate to indicate at least one of a number of predetermined abnormal functions of the heart, and to sequentially illuminate each of said light emitting means, and consequently said elements, in second predetermined illumination sequence and at a second predetermined rate to indicate the normal functioning of the heart;

selection means coupled to the control means for operator selection of any one of said predetermined illumination sequences;

a dummy pacemaker operable to be physically attached to the teaching device during the teaching process;

a dummy electrode operable to be physically attached to the illustration of the heart, whereby the possible portions of the heart which a pacemaker will stimulate, may be illustrated; and

first indicia at said dummy pacemaker and dummy electrode and second indicia at said predetermined element, each of said indicia being responsive to the connecting of said dummy electrode to said heart to indicate that the connection has been made.

4,091,550

AUTOMATED INSTRUCTIONAL APPARATUS AND METHOD

Lorenz P. Schrenk; James R. Datta, both of Minneapolis, and David G. Alden, Brooklyn Center, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 508,997, Sep. 25, 1974, abandoned.
This application Aug. 10, 1976, Ser. No. 713,261
Int. Cl.² G09B 23/18
U.S. Cl. 35—19 A 22 Claims

1. Automated instructional apparatus for teaching a student

by manipulation of at least one operating control to operate equipment including a plurality of equipment points normally maintained at predetermined conditions and for teaching a student to operate a tester of the equipment capable of indicating the point conditions, said apparatus comprising in combination:

equipment simulation means for simulating said equipment including test points for simulating said equipment points;

control simulation means for simulating said operating control;

control detection means for sensing the position of the control simulation means and for generating digital control condition signals representing the position of the control simulation means;

control storage means for storing the control condition signals;

test point storage means for storing digital test point condition signals representing a simulated condition at each of said test points;

tester simulation means for simulating said tester and for indicating the simulated conditions at the test points in response to a tester indicating signal;

selector means for selecting at least one of the test points for indication by the tester simulation means;

instruction means for presenting instructions to the student; and

data processing means for enabling the instruction means to present a first instruction requesting the student to move the control simulation means to a first position, for scanning the control storage means to detect the actual position to which the student moves the control simulation means, for comparing the first position to the actual position, for enabling the instruction means to present an instruction informing the student about the results of the comparing, and for transmitting to the tester simulation means a tester simulating signal derived from the digital test point condition signals corresponding to the one test point selected by the selection means, whereby the tester and equipment are realistically simulated and the errors in the student's movement of the control simulation means can be detected and communicated to the student, so that the student is readily taught to operate an actual piece of equipment and a tester.

10. An automated method of instructing a student to manipulate at least one operating control in order to learn the use of a piece of equipment having a plurality of points normally maintained at predetermined conditions and the use of a tester for the equipment, said method comprising the steps of:

simulating the equipment, points, operating control and tester;

storing digital test point condition signals having values representing a simulated condition at each of the points;

requesting the student to move the simulated operating control to a first position;

comparing the first position with the position to which the student moves the operating control;

informing the student about the results of the comparison;

selecting at least one of the points for indication by the simulated tester; and

indicating on the simulated tester the condition of the one point, whereby the student learns to operate the tester and equipment by manipulating the simulated operating control.

4,091,551

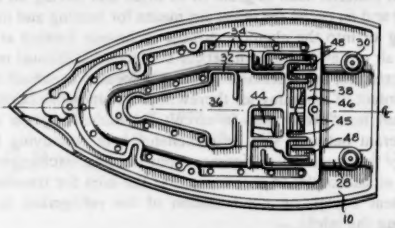
EXTRA CAPACITY STEAM IRON

Robert L. Schaeffer, LeRoy, N.Y., assignor to General Electric Company, Bridgeport, Conn.

Filed Oct. 28, 1976, Ser. No. 736,381

Int. Cl.[2] D06F *75/16*

U.S. Cl. 38—77.83 **6 Claims**



1. An extra capacity steam iron having a soleplate with steam ports and heating means with separate forward, main, and rear surge steam generators, means to selectively deliver water at the front and rear to the respective isolated generators, and heat regulating thermostat means, the improvement comprising:

a walled rear enclosure on the soleplate defining the separate isolated surge generator;

tortuous passage means from said rear enclosure to the ports;

a boss integral with and upstanding from the soleplate spacedly disposed in the enclosure;

a coverplate defining steam distributing means from the main generator and, with said enclosure and passage means, defining steam distributing means separately from said isolated surge generator;

said boss having plural slanted surface means sloping toward the soleplate;

said delivery means directing water substantially centrally of the boss;

whereby the boss forms a heat sink and water spreader throughout the enclosure for heat transfer to steam.

4,091,552

DIABETIC DIARY

Samuel C. Dickerson, 316 Gary St., Henderson, N.C. 27536

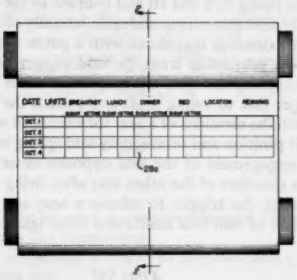
Filed Apr. 19, 1976, Ser. No. 677,961

Int. Cl.[2] G09F *11/24*

U.S. Cl. 40—518 **3 Claims**

1. A record keeping device for diabetics comprising a generally shallow rectangular housing containing rotatable spaced apart elongated rollers, one of said rollers initially carrying wound thereon a length of a record strip or web suitable for inscription and of a width somewhat less than the housing width and the other roller being connected to the free strip end for collecting the strip thereon during use, and at least one exteriorly accessible knob connected to each said roller for manual roller rotation to wind said strip between said rollers,

said housing having a planar back cover, opposite pairs of side and end walls extending generally perpendicular to the plane of said back cover, and a front wall extending between said side and end walls, said front wall having a planar panel section intermediate said end walls which is inclined in the end wall direction at an angle relative to said back cover, whereby one edge of said panel section is higher than the other relative to said back cover, and extending between the lower end of said inclined panel section and the adjacent end wall a connecting section which is bowed away from said back cover, one of said rollers being disposed within said bowed connecting section and the other adjacent the higher end of said inclined panel section, said inclined panel section having therein two elongated slots arranged in spaced generally parallel relation to each other and to said end walls, said slots having a length exceeding the record strip width, said record strip being delivered between said rollers along a path which is generally parallel to the inclined plane of said inclined front panel section and passing through said slots to dispose a region of said path exteriorly of said housing to permit inscription upon the web in



said region, said path tangentially intersecting the periphery of the roller adjacent the higher edge of said inclined panel section on the side thereof remote from said back cover and the periphery of the roller within the bowed connecting section on the side thereof toward said back cover, a plane extending across the space between said rollers and passing through the points of intersection of said path with the respective roller peripheries remaining substantially parallel to said planar panel section as said record strip is transferred from one roller to the other, said slots extending through said inclined panel section in opposite generally sloping directions substantially corresponding with said strip path, said record strip being divided cross-wise into parallel rows, one for each calendar day of a given recording period, and lengthwise into a plurality of columns for inscription thereon of the unit quantity of insulin injected per day, the times and results of multiple repetitive diabetic diagnostic tests, the selected body site for the injection, and miscellaneous comments by the patient, said housing carrying on its front wall appropriate indicia for identifying the respective columns.

4,091,553

EMERGENCY DISPLAY APPARATUS AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Shirley Lorraine Glennie, 1552 Odette Dr., Hartland, Mich. 48029

Filed Nov. 8, 1976, Ser. No. 739,984
Int. Cl.[2] B60Q 7/00; G09F 7/00
U.S. Cl. 40—591 **1 Claim**

1. An emergency sign display kit for motor vehicles comprising:

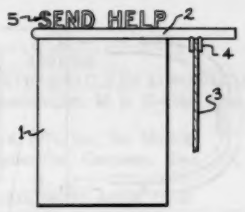
three emergency display signs, each said sign having prominently displayed thereon a different pictorial representation of a particular motorist emergency distress condition; said pictorial representations comprise a representation indicating a medical distress condition comprising a red cross on a white background, a representation indicating an out-of-fuel distress condition comprising a black gas can on an orange background and a representation indicating a need for a tow-truck distress condition comprising a blue tow-truck on a yellow-green background;

said pictorial representation of said particular motorist emergency distress condition is prominently displayed on each opposing face of each said sign;

each said emergency display sign is fabricated of a sheet of reflective, flexible, rollable cloth-like material;

each said emergency display sign including an elongated rigid arm member for supporting said signs so as to depend therefrom;

said arm member being provided with a groove for selectively engaging the upper edge of a vertically adjustable window of said motor vehicle to permit said arm member having said display sign depending therefrom to extend



substantially horizontally outwardly from said window when said adjustable window is adjusted to a substantially closed position so that said arm member is securely held in said substantially horizontal position between said upper edge of said window and said upper frame portion for said window;

each said arm member has provided at one end thereof identification means for easily determining the particular pictorial representation displayed on the sign depending from said arm member when said sign is in a rolled-up condition around said arm member; and

each said rigid arm member has further secured thereto a written distress notice, said distress notice being disposed in a position so as to be easily visible to passing motorists when said rigid arm member is in said substantially horizontal position extending outwardly from said window;

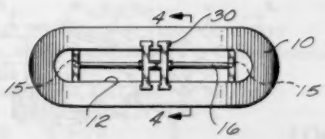
means for storing said sign during non-distress motorist driving conditions comprising a container.

4,091,554

ORNAMENTAL REPLACEABLE LETTER DISPLAYING DEVICE

Richard R. Bower, 3708 Crownridge Dr., Sherman Oaks, Calif. 91403

Filed Mar. 4, 1977, Ser. No. 774,637
Int. Cl.[2] G09F 7/02
U.S. Cl. 40—623 **7 Claims**



1. A decorative device for displaying replaceable letters or the like comprising: a thin metal plate having an elongated slot closed at both ends, a thin rod and plurality of replaceable letter units, each letter unit including a thin flat section shaped to conform to a letter or symbol, and a tubular member to

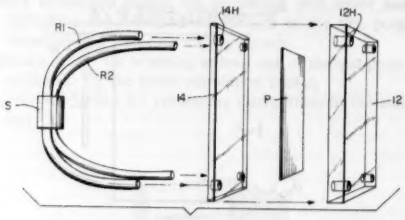
which the flat section is secured in tangential relationship the flat section extending a distance transverse to the tube a distance greater than the width of said slot, the flat section of the letter units bridging the narrow dimension of the slot on one side of the plate, the rod extending through the tubular member, means securing the ends of the rod to the plate; the rod extending the long dimension of the slot on the opposite side of the plate, the plate being clamped between the outer ends of the rod and the bridging letter sections of the letter units.

4,091,555

KNOCKDOWN SELF-SUPPORTING PICTURE FRAME DEVICE

Edward S. Korzon, Beacon Falls, Conn., assignor to Dura Plastics of New York, Inc., Westport, Conn.

Filed Dec. 22, 1976, Ser. No. 753,197
Int. Cl.[2] G09F *1/12*
U.S. Cl. 40—152.1 **8 Claims**



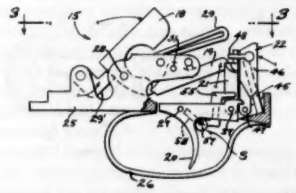
1. A free standing display frame device comprising:
an obverse viewing plate;
a backing plate substantially coterminous with said viewing plate for sandwiching an art object therebetween;
a plurality of assembly ports defined in said plates and extending in registry therethrough; and
a plurality of rod means frictionally mounted in said assembly ports and through both of said plates to maintain said plates and said art object in a sandwiched configuration;
said rod means extending rearwardly of said backing plate to provide a stand configuration for said display device;
said rod means being distorted to a common position rearwardly of said backing plate to enhance the frictional mounting thereof in said assembly ports and maintain the assembled condition of said viewing plate and said backing plate with said rod means; and
retaining means at said common position maintaining said distorted condition of said rod means.

4,091,556

TRIGGER SEQUENCER FOR TWIN BARREL GUNS

Philip K. Katsenes, 630 Idaho Ave., Apt. 201, Santa Monica, Calif. 90403

Filed Nov. 11, 1976, Ser. No. 740,814
Int. Cl.[2] F41C *19/00*
U.S. Cl. 42—42 R **10 Claims**



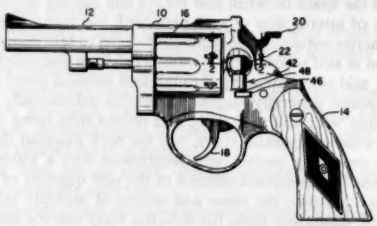
1. A selector for reversibly sequencing the firing order of a single trigger double barrel gun having a pair of laterally spaced sears and each releasable from a hammer held thereby in a cocked position to strike a firing pin and dishcharge a barrel, each sear being a lever with a shoulder coplanar one with the other when in cocked positions respectively, and each sear rotatable to an uncocked position when released from the hammer, the trigger being a lever carrying a trigger link in opposition to the shoulders of the sears to release the sears from the hammer, and including; means swively coupling the trigger link to the trigger for lateral as well as fore and aft swinging movement thereof between the sears, spring means biasing the trigger link forwardly, two pairs of laterally opposite coplanar transversely aligned latch steps on said trigger link, a pair of forwardly displaced inner latch steps and a pair of rearwardly displaced outer latch steps, means for positioned engagement of one inner latch step beneath the shoulder of one sear while holding the opposite inner latch step positioned from engagement beneath the shoulder of the other sear and while restraining the opposite outer latch step for subsequent positioned engagement beneath the shoulder of said other sear, operation of the trigger acting to engage the latch step beneath the shoulder of a sear to release it and the said hammer held thereby, and recoil means comprised of a separate inertia body pivoted to swing fore and aft and coupled to the trigger link by a manually shiftable stirrup slideable laterally of the said inertia body and extending therefrom with a guide opening engaged over a post projecting from the said trigger link, said recoil means being responsive to discharge of a barrel and applied to said trigger link to swing it aft and retract the latch step engaged with the shoulder of a sear for release of said sear to said uncocked position and returned by said spring means for repositioned engagement of the said opposite outer latch step beneath the shoulder of the other sear after firing the first barrel by operating the trigger to release a sear and hammer with engagement of said first mentioned inner latch step.

4,091,557

SAFETY FOR A REVOLVER

Frank Murabito, 64-24 80th Ave., Glendale, N.Y. 11227

Filed Oct. 19, 1976, Ser. No. 733,964
Int. Cl.[2] F41C *17/08*
U.S. Cl. 42—66 **9 Claims**



1. A safety for a revolver of the type including a mounting cylinder adapted to contain ammunition, a handle connected with the mounting cylinder and including a mounting cylinder release button, a triggering mechanism including a pawl in the handle for rotating the mounting cylinder, a pawl blocking element carried by said handle and connected with the release button, said button being movable from a normally open position whereby to permit opening of the mounting cylinder, to an intermediate safety non-firing condition, and to a normally closed position to permit firing of ammunition in the mounting cylinder, the pawl blocking element being movable with said button such that in the normally open position thereof, said pawl blocking element prevents the pawl from rotating said mounting cylinder in response to activation of said triggering mechanism and permits the ammunition to be fired in the normally closed position of the button, said safety comprising:
a notch element provided on said button, said button having three positions of rest, one being said normally open posi-

tion, the second being said safety condition and the third being said normally closed position; and

means adapted to engage said button for maintenance thereof in said safety position and movable out of engagement therewith to permit movement of said button to said other positions said means including a bar element support for movement on said handle, and a lever coupled to said bar element for movement of said bar element out of engagement with said notch element for movement of said button to said normally closed position.

4,091,558

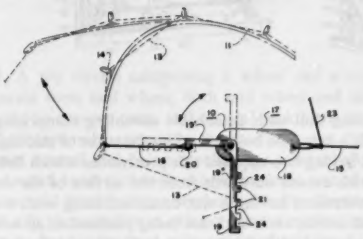
HOOKSETTER

David H. Dethlefs, 4117 NE. 10th Pl., Renton, Wash. 98055

Filed Oct. 7, 1976, Ser. No. 730,665

Int. Cl.² A01K *91/06*

U.S. Cl. 43—15 **8 Claims**



1. A hooksetter to be used in combination with a fishing rod including a fishing line comprising:

a loading line connected at one of its terminal ends to the tip of said fishing rod;

a positioning line which is connected at one of its terminal ends to a point close to the base position of said fishing rod;

a trip assembly having means releasably securing with the free terminal ends of said loading line and said positioning line to form a linear cord which retains said fishing rod in a flexed configuration, said trip assembly further including means engaging said fishing line which is disposed subjacently and rearwardly of said means securing said loading line and said positioning line, said trip assembly comprises a connecting tab which is secured to the free end of said positioning line, and a trip arm which is a substantially L-shaped member pivotally mounted at the end of said tab opposite said positioning line, and said trip arm being an inverted L-shaped member having a hook portion on one of its legs providing said means securing said loading line and wherein the opposing leg of said trip arm includes a hook portion providing said means engaging said fishing line.

4,091,559

TROTLINE REEL

Richard Arlen Easley, Rte. #1 - Box 456, Blanchard, Okla. 73010

Filed Sep. 10, 1976, Ser. No. 722,341

Int. Cl.² A01K *97/06, 87/00*

U.S. Cl. 43—54.5 A **4 Claims**

2. A trotline reel, comprising, in combination:

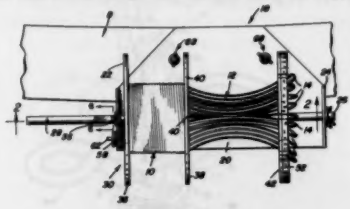
a support;

a shaft rotatably mounted on the support and including a substantially C-shaped notch;

a handle connected to the shaft adjacent said C-shaped slot;

a brake latch slidably and pivotally mounted on said support at a point adjacent said handle, said brake latch being provided with a peripheral curved ride slot and a rectangular brake slot, the slots selectively engaging the notch, with the ride slot permitting rotation of the shaft under a slight drag and the brake slot mating with the notch in the shaft to lock the shaft against rotation;

spool means mounting on the shaft for rotation therewith in winding and unwinding a trotline; and



hook-retaining means mounted on the support for detachably storing hooks of hook-carrying leaders connected to the trotline.

4,091,560

TRAP FOR AQUATIC SNAILS IN AQUARIUMS

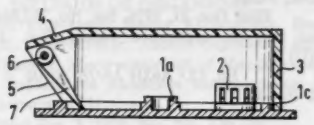
Wolfgang Haertling, Fruehlingstr. 11 b, D-8261 Winhoering, Unterau, Germany

Filed Dec. 6, 1976, Ser. No. 747,930

Claims priority, application Germany, Dec. 10, 1975, 393985[U]

Int. Cl.² A01K *69/06;* A01M *23/08*

U.S. Cl. 43—66 **17 Claims**



1. A trap for catching snails in an aquarium or the like, comprising:

(a) a base plate,

(b) housing means enclosing the upper surface of the base plate, said housing means having entry means movable by a snail or the like, whereby the snail will be permitted entry into the housing area, but denied exit therefrom,

(c) bait basket means, and

(d) mounting means for mounting the bait basket means on the base plate within said housing means at a position located eccentrically with respect to the center of the base plate,

wherein said housing means and base plate include engaging means for accomplishing the connection of said housing means at a plurality of rotative positions with respect to the center of the base plate, whereby the location of the bait basket means with respect to said entry means can be readily varied by changing the rotative position of the housing means on the base plate.

4,091,561

TRAVELING ROAD SYSTEM OF A TOY

Chiyuki Kimura, Showa, Japan, assignor to Okuma Seisakusho Co. Ltd., Japan

Filed Feb. 17, 1977, Ser. No. 769,434

Int. Cl.² A63H *33/00*

U.S. Cl. 46—1 K **5 Claims**

1. A toy road system comprising:

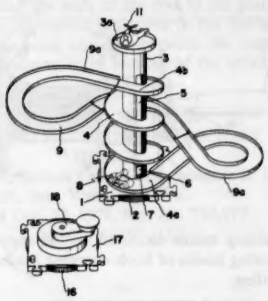
(a) a base;

(b) an elongated column having a longitudinal axis, one longitudinal end portion of said column being movably mounted on said base;

(c) drive means for turning said column about said axis;

(d) a helical toy roadway coaxially enveloping said column, said roadway having two axially spaced terminal portions, one of said terminal portions being fixedly fastened to said base;

(e) a slide axially movable on said column and secured thereto for joint angular movement about said axis;



(f) coupling means for coupling a toy to said slide for joint movement along said roadway during said turning of said column, said coupling means including a coupling member on said slide; and

(g) another toy roadway connecting said two terminal portions.

4,091,562

TOY RAILWAY SYSTEM

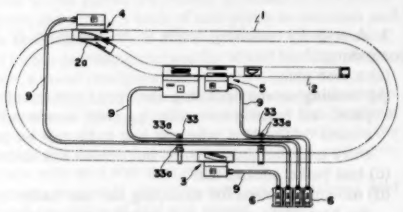
Chiyuki Kimura, Showa, Japan, assignor to Okuma Seisakusho Co. Ltd., Japan

Filed Dec. 21, 1976, Ser. No. 752,844

Claims priority, application Japan, Dec. 27, 1975, 50-177524[U]

Int. Cl.[2] A63H *19/18, 30/06*

U.S. Cl. 46—44 **9 Claims**



1. A toy railway system comprising:

(a) a track including a plurality of rail sections adapted to carry moving toy railway vehicles;

(b) a plurality of operating means secured to respective rail sections for modifying the movement of vehicles moving thereon, each operating means including an operating member mounted for movement between two terminal positions;

(c) a plurality of actuating means operatively connected to respective operating members for moving the same;

(d) a plurality of control means respectively associated with said actuating means; and

(e) a flexible, tubular member connecting each of said control means to the associated actuating means,

(1) each control means including manually operable means for transmitting air to the associated actuating means through said tubular member,

(2) each actuating means including moving means responsive to said transmitting for moving the associated operating member from one of said terminal positions thereof to the other terminal position, and arresting means for arresting said operating member in said other terminal position after said transmitting ceases.

4,091,563

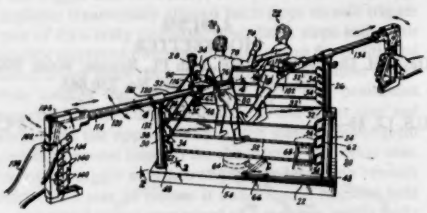
FIGHTING DOLL AND FIGHT RING WITH DOLL MANIPULATOR

Sidney Noble, 100 Warren Rd., West Orange, N.J. 07052, and Patrick Luke, 184 Nga Tsin Wai Rd., E-4, Kowloon, Hong Kong

Filed Nov. 8, 1976, Ser. No. 739,783

Int. Cl.[2] A63H *13/06*

U.S. Cl. 46—142 **9 Claims**



1. A fighting doll with detachable mounting comprising a fighting doll, a belt, said belt encircling the waist of said fighting doll and having two opposed side protrusions which define recesses which extend outwards from the surface of the doll, each said protrusion having a slot communicating with a respective said recess, each said slot being inclined at an acute angle from vertical with the upper end of each said slot being towards the back of said belt, a substantially semicircular resilient clamp, an inner protrusion and a substantially horizontal arm adjacent each end of said clamp, each said arm extending from the inner end of a said inner protrusion towards an end of the clamp, so that each said arm fits through a said slot for reception in a said recess when the doll is inclined from the vertical with the lower end of the doll away from the clamp, and so that the doll is mountable on the clamp when again raised to an upright position, the linear distance between said arms being greater than the linear distance between said slots when the ends of said resilient clamp are not displaced towards each other by the deforming of said resilient clamp, and substantially horizontal support means extending rearwards from said clamp, so that said fighting doll is supported in an upright position until angularly displaced by a blow from an opponent doll directed against the upper portion of said fighting doll, whereby when said fighting doll is angularly displaced, said arms move outwards from said slots and said resilient clamp springs to an non-deformed condition with the ends of said clamp spaced from said belt, and said fighting doll falls downwards from said clamp.

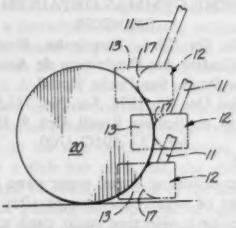
5. A fighting doll with toy prizefight ring which comprises a fighting doll, a toy prizefight ring, said ring having a square planar horizontal floor, four vertically oriented corner posts, and a plurality of horizontally oriented and spaced apart linear rail members, each of said rail members extending between two adjacent ones of said corner posts, the upper end of at least one of said posts having a central vertical cylindrical recess, a horizontal cylindrical rod, a cylindrical sleeve slidably mounted on said rod, said sleeve having a cylindrical protrusion which is slidably fitted vertically downwards into said recess, means at the outer end of said rod to manually grasp said rod, so that said rod may be concomitantly or alternately manually swivelled about said one corner post, rotated about its central horizontal axis, and horizontally displaced inwards or outwards relative to said ring, and means to mount said fighting doll on the inner end of said rod, so that said fighting doll is disposed within said ring and is manually displaceable about substantially the entire upper surface of the floor of said ring and may be concomitantly inclined sideways from a vertically upright orientation.

4,091,564

WHEEL AND CONTROL STICK ENABLING TURNING AND TILTING THEREOF

Irving R. Jasinski, 3737 Foxley Dr., Escondido, Calif. 92027

Filed Jun. 10, 1976, Ser. No. 694,846
Int. Cl.[2] A63H *33/02*
U.S. Cl. 46—220 3 Claims



1. A toy device comprising a wheel and a control stick separate from said wheel, both said wheel and control stick having no moving parts, said control stick having a free upper end adapted to be gripped by the hand of a user, the lower end of said control stick being attached to a substantially rectangular control head, said control head having a pair of spaced side plates, said head having a semi-circular disc disposed between said side plates and presenting a convex surface located adjacent to the longitudinal midportion of said head, said wheel having a peripheral width only slightly less than the distance between said side plates adjacent to said disc, said handle extending at an angle from vertical with respect to said control head so that when said handle is held by a user in standing position, said control head extends substantially parallel to the ground and transversely with respect to said wheel, said control head being of a vertical dimension rendering it vertically movable in a manner to allow said convex surface to engage substantially any portion along the periphery of said wheel from adjacent to the ground to adjacent to the top of said wheel, said side plates extending a substantial distance inwardly from the periphery of said wheel closely adjacent to, but free from substantial frictional engagement with the sides of said wheel, so that as said disc engages substantially any portion along the periphery of said wheel, said control stick is movable in any direction to change the direction of movement of said wheel throughout a directional range of 360°, said control stick being simultaneously tiltable to any angle up to 45° from vertical to either side to change the angle of said wheel with respect to the ground, both of said changes of direction of movement and tilt of said wheel being made without said wheel falling over or said control stick losing control of said wheel and without interfering with the free rotation of said wheel within said control head, said wheel being freely movable at all times in and out of said control head.

4,091,565

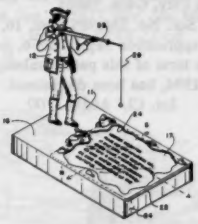
DECORATIVE TOY

Richard V. Sheehan, West Seneca, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Jan. 24, 1977, Ser. No. 762,016
Int. Cl.[2] A63H *33/26*
U.S. Cl. 46—238 1 Claim

1. A toy formed of a base plate to which an erect vertical figure is detachably mounted, with a generally horizontal rod extending from said figure and with an object suspended by a flexible string fixed to the free end of said rod,

said base formed with a window opening in the top surface in which a replaceable first sheet is displayed, the exposed face of which is covered by fixed markings, said first sheet backed by a magnetized second sheet of metal, and a transparent third sheet covering both first and second sheets, with



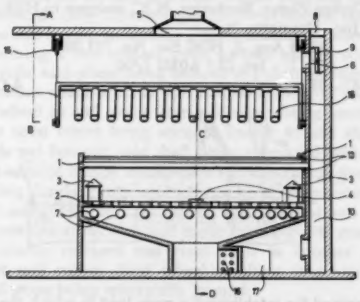
the suspended object magnetized so as to interact with the magnetic field of the magnetized sheet, when the object is swung as a pendulum.

4,091,566

EQUIPMENT FOR THE INVESTIGATION OR OPTIMIZATION OF THE PROPERTIES AND RAISING METHODS OF ORGANISMS

István Horváth, Esztergom; Sándor Köröspataky, Budapest; Sándor Rajki, Martonvasar; András Tejfalussy, Budapest, and Tibor Tischner, Martonvasar, all of Hungary, assignors to Magyar Tudomanyos Akademia Mezogazdasagi Kutato Intezete, Martonvasar, Hungary

Filed Sep. 3, 1976, Ser. No. 720,206
Claims priority, application Hungary, Sep. 5, 1975, MA 2716
Int. Cl.[2] A01G *9/02*
U.S. Cl. 47—17 10 Claims



1. Equipment for the investigation or optimization of the properties and raising methods of organisms, comprising means defining a horizontal support surface for a plurality of said organisms, said support surface extending in two horizontal directions perpendicular to each other, means for subjecting said organisms to a first factor affecting the growth of said organisms, means for progressively regularly varying the degree to which said organisms are subjected to said first factor in a first of said directions, means for subjecting said organisms to a second factor that affects the growth of said organisms, and means for regularly progressively varying the degree to which said organisms are subjected to said second factor in the other of said directions, said organisms being subjected to said first and second varying factors simultaneously.

4,091,567

FLOWER MOUNTING DEVICE

Mary Kathryn Higdon, and Zalita Higdon Speas, both of 1324 E. Grand, Ponca City, Okla. 74601

Continuation of Ser. No. 586,989, Jun. 16, 1975, Pat. No. 4,011,677. This application Sep. 9, 1976, Ser. No. 721,808
The portion of the term of this patent subsequent to Mar. 15, 1994, has been disclaimed.
Int. Cl.[2] A01G *5/00*
U.S. Cl. 47—55 2 Claims

1. A device for mounting a flower, said device consisting essentially of:

(a) means for mounting a flower, said means comprising a flexible body means including a spirallywound multi-strand wire member; and

(b) a bristle means positioned on a first end of said flexible body means,

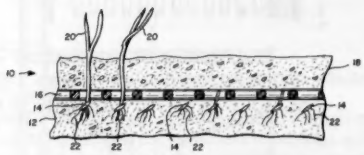
said bristle means comprising a plurality of bristles arranged in a helical configuration on said first end of said flexible body means, said bristle means having a conical configuration with the apex of said cone forming a point at said first end of said flexible body means.

4,091,568

GRASS PRODUCT AND METHOD OF MANUFACTURING THE SAME

Donald George Zinter, Rochester, N.Y., assignor to High Point Mills, Inc., Henrietta, N.Y.

Filed Aug. 2, 1976, Ser. No. 711,089
Int. Cl.[2] A01G *1/00*
U.S. Cl. 47—58 4 Claims



1. A method for establishing a grass land in which the grass roots are protected from root-feeding grubs hatched from eggs laid by insects such as European Chafers and Japanese Beetles comprising:

preparing a lower layer of rooting material which may contain grass seed;

covering said lower layer with a nondegradable screen having a predetermined mesh size for preventing insects larger than said predetermined mesh size from passing through said screen into said lower layer to lay eggs, and residual grubs hatched from eggs in said lower layer from burrowing from said lower layer through said upper layer to form insects; and

distributing an upper layer of rooting material over said screen whereby, upon germination of said grass seeds, the grass blades travel upwardly through said upper layer and the grass roots travel downwardly into said lower layer in a direction away from said screen.

4,091,569

PROCESS FOR THE OBTAINING OF SOUND SUGAR CANE GEMMAS FOR THE CONTROL OF THE BLIGHT OF SUGAR CANE STUMPS LEFT AFTER CUTTING AS WELL AS THE GEMMAS OBTAINED BY SAME PROCESS

Wilson Marcelo Da Silva, Piracicaba, Brazil, assignor to Cooperativa Central dos Produtores de Acucar e Alcool do Estado de Sao Paulo, Sao Paulo, Brazil

Filed Oct. 12, 1976, Ser. No. 731,515
Claims priority, application Brazil, Oct. 9, 1975, 7506625
Int. Cl.[2] A01G *1/00*
U.S. Cl. 47—58 6 Claims

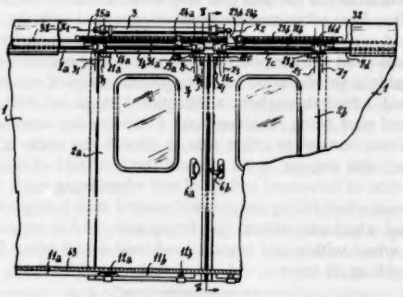
1. Process for obtaining sound sugar cane gemmas for the control of blight of sugar cane stumps after the stalks have been cut, comprising, selecting sugar cane stalks of uniform size in natural form containing an outer crust and having pith within the crust and having bud portions or gemmas thereon, cutting the stalks into suitable lengths containing the gemmas, cutting the lengths in transverse sections to form disc shaped sections of substantially uniform size including gemmas thereon, and subjecting said disc shaped portions to a thermo-theraputic treatment by subjecting them to a predetermined uniform heat for a predetermined time to obtain a complete and uniform heating in every portion of the disc portions containing the gemmas and the pith so as to accomplish complete destruction of the blight causing agent without harming the gemmas.

4,091,570

OBLIQUE-DISPLACEMENT SLIDING DOOR

Michel Favrel, Le Perreux-sur-Marne, France, assignor to Faiveley S.A., Saint-Ouen, France

Filed Nov. 14, 1975, Ser. No. 631,924
Claims priority, application France, Dec. 10, 1974, 74 40483
Int. Cl.[2] E05F *17/00*
U.S. Cl. 49—118 4 Claims



1. An oblique-displacement sliding door comprising a stationary door-frame and at least one door-leaf which is vertical in the service position and capable of moving along a substantially horizontal sliding axis parallel to a top edge and a bottom edge of the door-leaf, said edges of the leaf being associated with fixed guide rails attached to the door-frame, in order to be engaged transversely within the door-frame in the closed position and disengaged from the frame in the opposite direction, operating means for moving the door-leaf along the sliding and stabilizing means for maintaining each leaf parallel to said sliding axis and comprising for each leaf a single slide-bar connected to the operating means and mounted in a slideway parallel to said axis, the slideway being fixed on the door-frame, the top edge of the door-leaf being suspended from the slide-bar by a deformable coupling system for a translational

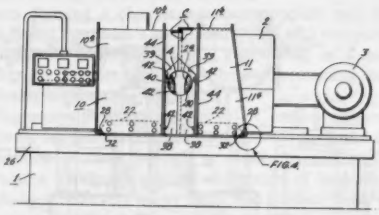
displacement of the leaf driven by the slide-bar along the axis of the guideway and a transverse displacement of the leaf with respect to the slide-bar under the action of the guide rails, two opposite leaves mounted symmetrically on each side of the door, the slide-bars associated respectively with each door-leaf being mounted on slideways having a common axis, and the movements of the slide-bars being combined symmetrically by a coordinating mechanism comprising on each slide-bar a nut combined with a threaded rod rotatably mounted on supports connected to the frame in parallel relation to the axis of the slideways, wherein the rod and the nut associated with each slide-bar on each door-leaf have such a thread as to constitute a reversible-action motion converter between the two door-leaves and a rod of an actuating jack fixed to the door-frame in parallel relation to the axis of the slide-ways, said rod being connected with a slide-bar of a leaf, the slideway which is parallel to the axis of sliding motion of the door-leaves being bove the rails for guiding the top edge of each door-leaf, the threaded rod for the coordination of the door-leaves and the operating jack being substantially in superimposed relation above said rails and slideway, the rod of said jack being connected to one of the slide-bars by means of an arcuate cross-member which passes around the profile of the supports of the coordinating rod.

4,091,571

CASING FOR THE GRINDING POSITION IN A CENTERLESS GRINDING MACHINE

Bengt Nilsson, Lidkoping, Sweden, assignor to Lidkopings Mekaniska Verkstads AB, Lidkoping, Sweden

Filed Oct. 4, 1976, Ser. No. 729,481
Claims priority, application Sweden, Oct. 9, 1975, 75113027
Int. Cl.² B24B *5/18, 55/04*
U.S. Cl. 51—103 TF **7 Claims**



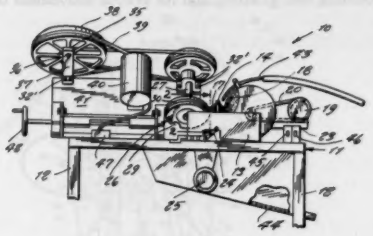
1. A grinding machine comprising a base, a grinding wheel supported on the base, a feed roller in close proximity to the grinding wheel mounted on a device which is tiltable and displaceable relative to the base for adjustment of the feed roller relative to the grinding wheel, a first wall carried by the grinding wheel support arranged preferably vertically and parallel to the axis of the grinding wheel, said wall being directed along a chord of the grinding wheel and having a cut out exposing a portion of the periphery of said grinding wheel to the grinding area, a second wall mounted on the device supporting the feed roller and preferably disposed vertically and parallel to the axis of the feed roller, said first and second walls longitudinally spaced apart on either side of the grinding area and defining the end closures therefor, a pair of hood members mounted on said base for displacement relative to said walls, one hood member circumscribing said first wall and the other hood member circumscribing said second wall and each hood member having a through opening in the direction of displacement closely conforming to the periphery of the respective walls, said hood members displaceable relative to said walls toward one another to a closed position providing a generally closed chamber around the grinding area and away from one another to an open position to expose the grinding area.

4,091,572

LAPIDARY SPHERE GRINDER

Gabriel J. Denning, 401 Chase, Wakeeney, Kans. 67672

Filed Jun. 6, 1977, Ser. No. 804,068
Int. Cl.² B24B *11/08*
U.S. Cl. 51—103 R **1 Claim**



1. A sphere grinding machine, comprising, in combination, a table supported upon legs, a motor driven grindstone carried upon said table providing a means for grinding a surface of a stone for imparting a spherical shape thereto, a slide member with an insert-carrying stone holder carried by said table with crank means for moving said stone holder towards and away from said grinding wheel, an angularly positioned and shaft mounted rubber tired wheel carried on plate means above said table for intermittently rotating said stone being ground, pulley, belt, and motor means carried upon said plate, providing rotation means for said rubber tired wheel, crank means for moving said plate carrying said rubber tired wheel, a chute carried by said table providing gravity takeoff means for the ground away material of said stone, switch means on said table for controlling said motor driven grindstone and a coolant recirculating pump, said stone holder being rimed, and secured fixedly, to said slide member which holds said stone holder, and said stone holder receives a removable insert having an opening which aligns with an opening of said stone holder, said stone being presented and retained within said opening of said stone holder, against a peripheral edge of said grindstone, said crank means for moving said stone holder enabling said insert to be brought away from said grindstone as wished, said rubber tired wheel having an annular groove around its outer periphery forming a two-contact point surface against which said stone rolls, said wheel being secured to a shaft mounted to said plate means which is crank operated, so as to move said rubber tired wheel to and away from said stone being ground, said rubber tired wheel being secured fixedly to said shaft by a suitable nut fastener, said shaft being supported within block means secured fixedly to said table and said rubber tired wheel including a semicircular notch at one point on an outer periphery of said rubber tire, said notch when rotated into position for communication with said stone enabling said stone to be momentarily released and reset itself in another position against said rubber tired wheel resulting in an irregularly shaped stone being spherically ground.

4,091,573

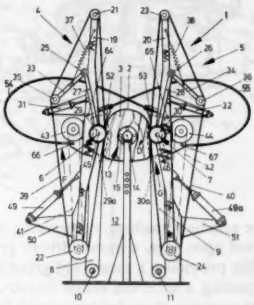
MACHINE FOR GRINDING THE EDGE AREAS OF FORMED PARTS

Erich Schmidt, Mauerbach, Austria, assignor to Maschinenfabrik Zuckermann Komm. Ges., Vienna, Austria

Filed Mar. 4, 1977, Ser. No. 774,339
Claims priority, application Germany, Mar. 5, 1976, 2609199
Int. Cl.² B24B *21/02*
U.S. Cl. 51—140 **19 Claims**

1. A machine for grinding the edge areas of slab formed parts comprising a frame, means carried by said frame for clamping the formed part in a manner leaving its edge areas free and for rotating the formed part about an axis in a plane substantially normal to said axis, a grinding unit carried by said frame including guide rollers and a grinding belt conducted over said

guide rollers, a pressure element carried by said frame having a cross section generally matched to the edge area to be ground, means carried by said frame including said pressure element for pressing said grinding belt against the formed part, an arm carried by said frame for pivotal movement in a plane parallel to the plane of rotation of the formed part, means mounting said grinding unit for pivotal movement on said arm



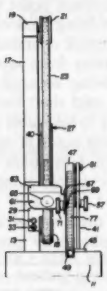
and about an axis of rotation generally parallel to the pivotal axis of said arm so that said belt grinding unit can be pivoted about its axis of rotation in the plane of rotation of the formed part, and means for adjusting the direction of approach of the grinding belt in accordance with the rotational position of the formed part such that the angles formed by the belt and the formed part as the belt approaches and leaves the formed part are generally equal one to the other.

4,091,574

TOOL SHARPENING FIXTURE FOR A GRINDING TOOL

Norman H. Horwitz, 6608 Cottonwood Knoll, West Bloomfield, Mich. 48033

Filed Jun. 15, 1977, Ser. No. 806,821
Int. Cl.[2] B24B *3/60, 21/10*
U.S. Cl. 51—141 **15 Claims**



1. In combination, a tool sharpening fixture and a grinding tool having at least a pair of spaced pulleys, a continuous flexible abrasive belt mounted around said pulleys, one of said pulleys being power-driven;

said fixture comprising a leg for mounting said fixture upon said grinding tool and securement thereto;

an elongated support arm at one end pivotally, angularly and adjustably mounted upon said leg;

a manually releasable retainer means on said leg securing said arm at a predetermined angular position relative to said leg;

a tool anchor plate extending laterally of said arm;

means slidably mounting said anchor plate upon said arm along its length, to support different lengths of tools to be sharpened;

releasable means on said arm for securing said anchor plate in longitudinally adjusted position;

and an elongated upright platen of generally arcuate shape mounted upon the base of said grinding tool and supportably and guidably bearing against the interior surface of said belt;

said anchor plate adapted to supportably and retainingly engage the handle of a tool, with its blade applied to said belt adjacent the underlying surface of said platen;

so that manual pressure applied to said tool causes the tool cutting edge to contact the grinding surface of said belt corresponding to the adjacent underlying shape of the platen, whereby a flat or hollow ground edge is formed in said blade;

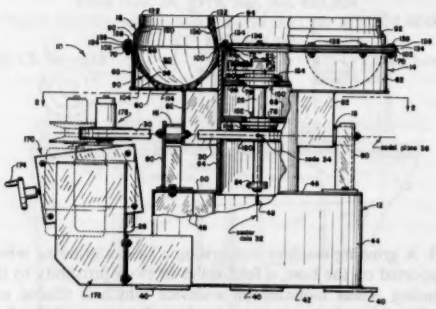
the pivot axis of said arm to said leg being generally in registry with said arcuate platen surface.

4,091,575

BOWL-TYPE VIBRATORY FINISHING MACHINE

John F. Rampe, Mayfield Heights, Ohio, assignor to Rampe Research, Cleveland, Ohio

Filed Aug. 16, 1976, Ser. No. 714,823
Int. Cl.[2] B24B *31/06*
U.S. Cl. 51—163.2 **47 Claims**



1. A bowl-type vibratory finishing machine, comprising:

(a) a base structure having a vertical axis with a point thereon referred to as a nodal point;

(b) a bowl structure defining a substantially annular chamber adapted to receive finishing media and workpieces to be finished;

(c) a plurality of elastomeric mounts movably supporting the bowl-structure on the base structure, each of the mounts having one portion secured to the bowl structure and another portion secured to the base structure, the one and another portions defining an axis for each mount;

(d) drive means for vibrating the bowl structure relative to the base structure to impart a finishing action to contents of the chamber with the bowl structure moving substantially about the nodal point;

(e) the elastomeric mounts being arranged such that their axes intersect at and extend in a radial array outwardly from the nodal point, whereby the mounts tend to direct movements of the bowl structure around the nodal point relative to the base structure.

4,091,576

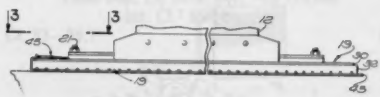
RETENTION OF ABRASIVE SHEET MATERIAL ON AN ABRADING TOOL

Alma A. Hutchins, 49 N. Lotus Ave., Pasadena, Calif. 91107

Continuation-in-part of Ser. No. 655,992, Feb. 6, 1976, abandoned. This application Jun. 9, 1976, Ser. No. 694,457

Int. Cl.[2] B24B *23/00;* B24D *17/00*

U.S. Cl. 51—170 TL 22 Claims



1. A portable abrading tool comprising:

a body adapted to be held and be manipulated by a user;

a shoe carried movably by said body and including a backing plate which is to extend essentially horizontally when abrading an upwardly facing work surface, and a cushion carried at the underside of said backing plate and having an undersurface;

an abrading sheet which is flexible but has some stiffness and which extends along the underside of said cushion and carries a layer of pressure sensitive adhesive at its upper side engaging the undersurface of said cushion and adhered thereto;

said undersurface of the cushion being formed of a substance to which said adhesive will adhere tightly in use but from which the adhesive can be stripped with said sheet for replacement;

said sheet extending upwardly at the forward end of said shoe and having an end portion doubled back generally rearwardly at the upper side of said backing plate;

a clamping element carried by said backing plate at its upper side near the forward end thereof;

means forming a clamping surface opposite said element defining therewith a space into which said end portion of the sheet projects generally rearwardly in a confined relation coacting with said adhesive in retaining the sheet during an abrading operation;

spring means yieldingly urging said clamping element relatively toward said opposed surface and toward a normal position of close enough proximity to said surface to require yieldingly resisted deflection of said clamping element relatively away from said surface upon sliding insertion of the sheet rearwardly therebetween;

said spring means being constructed to clamp said sheet between said element and said surface with a predetermined fixed spring force which is the same during sliding insertion of the sheet rearwardly between the element and surface as after the sheet reaches a fully inserted position in which it is retained by said spring force during an abrading operation;

said fixed spring force being light enough to enable a user while grasping said sheet manually at a location forwardly of said clamping element to push said end portion of the sheet rearwardly between the clamping element and opposed surface and to said fully inserted position, by force exerted from the hand of the user rearwardly through the flexible sheet, and against the frictional resistance offered by the lightly clamped retention of the sheet between the clamping element and said surface;

shoulder means positioned to engage an end edge of said abrading sheet and limit insertion thereof into said space between said clamping element and said surface; and

a motor carried by said body and operable to power actuate said shoe and carried sheet relative to the body in an abrading motion while said element is clamped against said sheet with only said light fixed spring force which is exerted against the sheet during insertion.

4,091,577

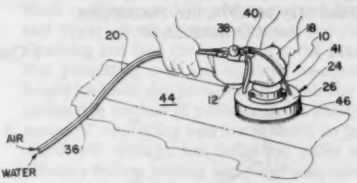
WET-SANDING MACHINE

Antonio Ortiz, 420-18 E. 111th St., New York, N.Y. 10029

Filed Nov. 2, 1976, Ser. No. 738,119

Int. Cl.[2] B24B *55/02*

U.S. Cl. 51—170 T 6 Claims



1. A hand-held power-operable wet-sanding machine comprising:

a frame;

a generally vertical spindle journaled in said frame;

a sanding wheel with an abrasive underside mounted on said spindle for rotation about its axis;

an apertured brush carrier concentrically disposed about said sanding wheel and provided with bristles terminating substantially at the level of said abrasive underside;

drive means for rotating said sanding wheel and said brush carrier about said axis; and

conduit means connected to a source of water and extending toward the apertures of said brush carrier for wetting said bristles.

4,091,578

PROCESS AND APPARATUS FOR TRUING THE HEAD OF RAILS OF A RAILWAY

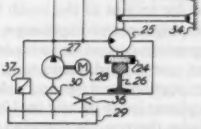
Romolo Panetti, Geneva, Switzerland, assignor to Speno International S.A., Geneva, Switzerland

Filed Dec. 27, 1976, Ser. No. 754,009

Claims priority, application Switzerland, Jan. 7, 1976, 000094/76

Int. Cl.[2] B24B *23/00*

U.S. Cl. 51—178 12 Claims



1. A process for on-track truing of the surfaces of the head of a rail of a railway wherein a predetermined number of grinding tools, angularly oriented in a plane normal to said rail and each operating along a tangent to the profile of the head of said rail, are moved at generally constant longitudinal speed along the generatrices of said surfaces, said process comprising effecting rotational drive of said grinding tools to grind the profile of the head of said rail, relating the value of at least one of the parameters affecting the metal removing ability of at least one of the grinding tools to a predetermined control value which is predetermined as a function of the desired cutting depth of the said tool and controlling the bearing pressure of said at least one grinding tool by regulation in a closed feed-back loop of

the bearing pressure of the tool as a function of the rotational drive of the grinding tool.

4,091,579

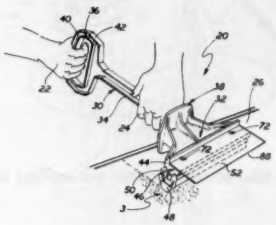
SCRAPER

Clayton Giangiulio, 5 Skyline Dr., Malvern, Pa. 19355

Filed May 24, 1976, Ser. No. 689,396

Int. Cl.[2] B24B *23/00*

U.S. Cl. 51—181 R **1 Claim**



1. A device for cleaning grills and griddles comprising an elongated shaft having a working end, an intermediate portion, a grasping end and a barrier wall interposed between said working end and said intermediate portion and spaced from said working end, said grasping end terminating in a handle disposed generally normally to the axis of said shaft and including a portion encircling one's hand when said hand grasps said handle, said intermediate portion serving as the means for grasping said device with the other hand to enable the device to be used to scrape grills and griddles, said barrier wall projecting circumferentially outward from said shaft and being of sufficient size to preclude said other hand from sliding down said shaft and into contact with the grill or griddle being scraped, said working end terminating in a tool holder, said tool holder including first means releasably securing either a first or a second scouring means thereto and second means releasably securing either a first or a second scraping means thereto, said first scouring means comprising an elongated abrasive stone and said second means comprising a brush having a flared channel-shaped backing member, said first releasable securing means comprising an elongated member having a recess for receipt of said abrasive stone and including a pair of side walls and an elongated tapered groove disposed opposite to said recess, said tool holder including a projection extending therealong and secured within said groove, said projection being tapered such that when disposed within said groove the side walls of the recess flex to frictionally engage the abrasive stone and hold it in place, said recess including a tapered central channel adapted for receipt of the brush backing member therein, said first scraping means comprising a planar blade and said second scraping means comprising a blade having a planar portion and at least one fanged projection extending at an angle to the planar portion, said second releasable securing means comprising a planar ledge on said tool holder for mounting either of said blades thereon via threaded fastening means.

4,091,580

PROCESS FOR HOLDING AND CUTTING SHEET GLASS

William Lee Oates, Bernardsville, N.J., assignor to Timex Corporation, Waterbury, Conn.

Filed Jun. 29, 1977, Ser. No. 811,353

Int. Cl.[2] B24B *27/06*

U.S. Cl. 51—283 R **6 Claims**

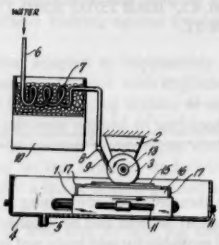
1. A process for holding and cutting sheet glass, comprising the steps of:

cooling a glass sheet and a base member together with a liquid to freeze them together,

providing a cooling fluid comprising the same liquid at a temperature just above the freezing point of the liquid,

flowing said liquid over the sheet glass to cause it to form a frozen scale completely enclosing the top surface of the glass,

cutting said glass sheet with a rotary blade, while cooling the blade and glass sheet with the same liquid, and



allowing the liquid to thaw and removing the pieces of cut glass.

4,091,581

ACCOMMODATION FOR TEMPORARY MANNING OF VESSELS

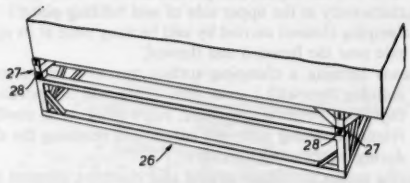
Dennis Roland Abbott, 'Friarywood', Frome Rd., Hinton Charterhouse, Nr. Bath, County of Avon, England

Filed Sep. 17, 1976, Ser. No. 724,226

Claims priority, application United Kingdom, Sep. 22, 1975, 38871/75

Int. Cl.[2] E04B *1/348*

U.S. Cl. 52—79.1 **1 Claim**



1. In an accommodation module system adapted to provide accommodation for the temporary manning of a seagoing vessel, said module being adapted for transportation on a container truck and for mounting on the deck of a seagoing vessel, the improvement wherein

(a) said accommodation module comprises a watertight metal box-shaped unit, said unit being divided by at least one internal bulkhead to form at least two compartments; and

(b) means for securing said unit to the vessel, said means including

(1) at least four mounting shoe means depending from the floor of said unit, each of said mounting shoe means being formed of a metal box section, one pair of said mounting shoe means being arranged adjacent two corners of said module and another pair of said mounting shoe means being spaced slightly inwardly from the other corners of said module;

(2) diagonally extending strengthening members extending from each of said shoe means to the floor of said unit, thereby to stabilize said shoe means;

(3) a metal framework support adapted to be fixedly secured to the deck of the vessel, said framework containing recess means for receiving said mounting shoe means, respectively;

(4) said framework support and said shoe means containing aligned through apertures; and

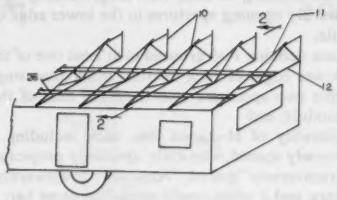
(5) locking pin means extending through said aligned apertures for securing said unit to the framework support.

4,091,582

TRUSSED ROOF STRUCTURE FOR PREFABRICATED BUILDINGS

Robert Raymond Lawrence, 205 W. 5th St., Alturas, Calif. 96101

Filed Sep. 13, 1976, Ser. No. 722,885
Int. Cl.[2] E04B *1/343*
U.S. Cl. 52—79.7 **1 Claim**



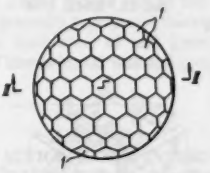
1. A trussed roof structure comprising
a. a longitudinally elongated wooden upper chord member.
b. a longitudinally elongated wooden lower chord member substantially equal in length to said upper chord member,
c. means connecting said upper and lower chord members so that said upper chord, in final use, is spaced above said lower chord in the same vertical plane but lying at an angle with said lower chord, said means including multiple slanted wooden web members each of said web members incorporating flat gusset plates at each end, said gusset plates being constructed of one of the general class of materials characterized by plywood, hard board and particle board, said gusset plates connect said web members to said upper and lower chord members, respectively, utilizing such fasteners as glue alone, glue and staples or staples alone, said means of connecting said upper and lower chord members also includes a heel gusset plate being constructed and fastened as mentioned above for gusset plates, which connect said upper and lower chord members together at or relatively near their point of intersection,
d. a longitudinally elongated wooden end post connected to said lower chord by a gusset plate, being constructed and fastened as indicated above for gusset plates, which also connects a slanted web member to said lower chord, said end post lying in same vertical plane as upper and lower chord members and intersecting said lower chord at right angles,
e. means connecting trussed roof structure to prefabricated building ridge beam such that said end post lies flat or nearly flat against said ridge beam and staples, nails, or screws, with or without glue, make the connection between said ridge beam and said end post,
f. a longitudinally elongated horizontal wooden web member, said member lying in the same vertical plane as said upper and lower chord members and said horizontal web member also lying at or near right angles to, and in the same vertical plane as, said end post member and connected therewith by means of a flat gusset plate, being constructed and fastened as mentioned above for gusset plates, said horizontal web member serving to assist said upper chord in support of a longitudinally elongated shear block by means of a flat gusset plate connected to said horizontal web member and also said upper chord member, said shear block serving purpose of supporting lower end of an upper chord segment,
g. a longitudinally elongated wooden member constituting said upper chord segment which when finally installed lies adjacent to and is colinear with said upper chord member, of substantially shorter length than said upper chord member, and final positioning of said upper chord segment completes, in form, a right triangle figure bounded by upper chord segment, upper chord member, lower chord member, and end post member, respectively, said upper chord segment being supported at its lower end by said shear block and at its upper end by means of a bearing block resting upon the prefabricated building ridge beam, said upper chord segment allowing completion of roof sheathing and final roof covering at the final erection site thus permitting over the highway transport of a lower height load and also permitting concealment of roof interconnection method of prefabricated building halves,
h. means of reinforcing said lower chord so that said lower chord will undergo less deflection under effect of contributary ceiling loading and more adequately resist flexural and axial unit stresses so induced, said means being a longitudinally elongated stiffener member lying above and at right angles to each of said lower chords of said roof trusses while in their parallel configuration, attaching to perspective lower chords at points at or near mid span of said lower chord between panel points, said means of connection being characteristically glue and/or staples, nails or screws.

4,091,583

WALL OF PRESSURIZED REINFORCED CONCRETE TANK

Semen Naumovich Genis, ulitsa Krjukovskaya 23, kv. 33, Moscow; Adolf Nikolaevich Zhivov, ulitsa Sverdlova 13, kv. 14, Kiev; Nikolai Alexandrovich Pereyaslavtsev, ulitsa Bolshaya Podvalnaya 14, kv. 76, Kiev; Igor Vladimirovich Sukhenko, ulitsa Narodnaya 6/31, kv. 20, Kiev; Nadezhda Grigorievna Vasyagina, ulitsa Bereznyakovskaya 16a, kv. 108, Kiev, and Viktor Ivanovich Shotsky, ulitsa Borchagovskaya 117/125, kv. 45, Kiev, all of U.S.S.R.

Continuation of Ser. No. 536,447, Dec. 26, 1974, abandoned.
This application Nov. 24, 1975, Ser. No. 634,630
Int. Cl.[2] E04B *1/32*
U.S. Cl. 52—81 **7 Claims**



1. A wall of a pressurized reinforced concrete enclosed tank composed of two parts: a prestressed outer part defining the shape of the tank, and an inner part supported by said outer part, said inner part in a state of compression under the action of a hydrostatic pressure within said tank and comprising a plurality of reinforced concrete arcuate portions adjoining each other, the surface of each said arcuate portion comprising a part of a convex surface of revolution and facing the interior of said tank, said tank being formed in the shape of a polyhedron with the surface inscribed in a sphere, said arcuate portions being formed in the shape of dome-shaped members.

4,091,584

SMALL BUILDING STRUCTURE

Ralph E. Brown, 1421 NW. 40th Ter., Gainesville, Fla. 32605

Filed Feb. 9, 1977, Ser. No. 766,936
Int. Cl.[2] E04B *1/32, 1/12*
U.S. Cl. 52—86 **8 Claims**

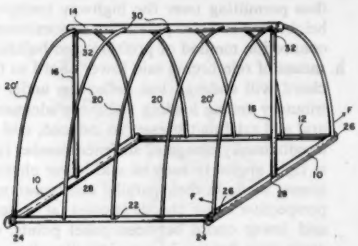
1. A skeletal frame for a greenhouse and the like comprising: a base formed from two side members and one or more

connecting end members fixing said side members together;

a ridgepole approximately equal in length to said side members;

a vertical member connected to said base and to said ridgepole; and

a plurality of arcuate ribs formed from straight members bent to an arcuate shape, said arcuate ribs connected to said ridgepole at the apex of each arcuate rib and the ends



of said arcuate ribs connected to said side members forming a set of parallel semicircular ribs spaced along said side members of said base;

wherein the connections of all of the elements of said frame are formed by respective ends of said elements being inserted in and through openings in others of said elements and in which the integrity of said skeletal frame is maintained from tensions caused by such elastic bending of said arcuate ribs.

4,091,585

CONCRETE-FILLED, BLOCK AND TIE WALL BUILDING SYSTEM

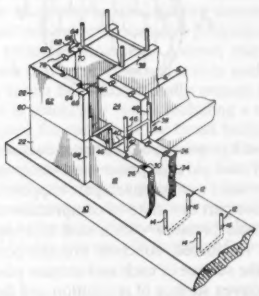
John Rudichuk, Calgary, Canada, assignor to Speed-Form Manufacturing Ltd., Canada

Continuation-in-part of Ser. No. 528,575, Nov. 29, 1974, which is a continuation of Ser. No. 290,737, Sep. 20, 1972, abandoned.

This application Oct. 1, 1976, Ser. No. 728,506

Int. Cl.[2] E04B 1/00

U.S. Cl. 52—274 **6 Claims**



1. A filled block and tie wall building system comprising:

a footing;

an inner wall of generally thin cross section rectangular flat-ended, flat-edged vertically disposed precast concrete modules abutted flat end to flat end in each course and arranged in a plurality of superimposed courses in which lower edges of modules in upper courses abut upper edges of respective lower courses;

an outer wall of generally thin rectangular flat-ended, flat-edged vertically disposed precast concrete modules generally corresponding in size and shape to the modules of the inner wall abutted flat end to flat end in each course and arranged in a plurality of superimposed courses in which the lower edges of modules in upper courses abut upper edges of respective lower courses;

the inner and outer walls being transversally spaced in a parallel manner, with corresponding courses of each wall being at equivalent heights;

the lower edges of the lowermost courses of the modules being supported upon said footing;

means securing said lowermost courses to the footing to prevent lateral movement of the inner and outer walls with respect to the footing;

means defining at least two longitudinally spaced, upwardly opening apertures in the upper edge of each module;

means defining at least two longitudinally spaced, downwardly opening apertures in the lower edge of each module;

means defining two grooves in at least one of the upper and lower edges of each module, interconnecting the respective two apertures with the inner face of the respective module; and

a plurality of H-shaped ties, each including: two, transversely spaced, vertically upwardly projecting legs; two, transversely spaced, vertically downwardly projecting legs; and a transversely extending cross bar;

the ties being assembled with the modules as follows: each tie having the two downwardly projecting legs thereof received in respective two of the upwardly opening apertures in the upper edges of two transversally spaced ones of said modules at equivalent heights; each respective tie having the two upwardly projecting legs thereof received in a respective two of the downwardly opening apertures in the lower edges of two transversally spaced ones of said modules in the next upper course at equivalent heights; and the transversally extending cross bar being received in a respective two of said grooves in a respective transversally spaced two of said modules; the inner and outer walls being characterized by the absence of mortar between the abutting ends and edges of adjacent modules in same inner wall and between the abutting ends and edges of adjacent modules in the same outer wall;

a poured and set filling of concrete or filling material substantially filling the space between the inner and outer walls and uniting the modules and ties into an integral wall; and wherein:

said integral wall exists in two portions disposed at a vertical axis right angle to one another, to provide a corner having an outside in one said wall and an inside in the other said wall;

an H-shaped tie bent partially double about a vertical axis intermermediate said cross-bar thereof, the two transversally spaced downwardly projecting legs of said bent H-shaped tie being received in the two of said upwardly opening apertures in the module upper edges which are nearest said corner to the left and right of said corner in said one wall in one course thereof and the two transversally spaced upwardly projecting legs of said bent H-shaped tie being received in the corresponding two downwardly opening apertures in the module lower edges in the next upper course of said one wall to provide a loop between the inner and outer walls at the corner;

a first U-shaped tie placed between said inner wall and said outer wall,

said first U-shaped tie having two transversally spaced generally vertically projecting legs at opposite ends of a generally horizontally extending base, one of said legs of the first U-shaped tie being doubled hook-fashion through said loop and the other of said legs of the first U-shaped tie being doubled hook-fashion about the cross bar of the nearest of the first-mentioned H-shaped ties to the right of the corner; and

a second U-shaped tie placed between said inner wall and said outer wall,

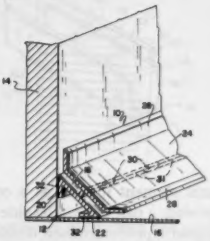
said second U-shaped tie having two transversally spaced

generally vertically projecting legs at opposite ends of a generally horizontally extending base, one of said legs of the second U-shaped tie being doubled hook-fashion through said loop and the other of said legs of the second U-shaped tie being doubled hook-fashion about the cross bar of the nearest of the first-mentioned H-shaped ties to the left of the corner.

4,091,586
MOLDING

David O. Schwartz, 244 Fairhaven Blvd., Woodbury, N.Y. 11797

Filed Jul. 11, 1977, Ser. No. 814,533
Int. Cl.[2] A47K *3/16;* E04F *19/04*
U.S. Cl. 52—287 3 Claims



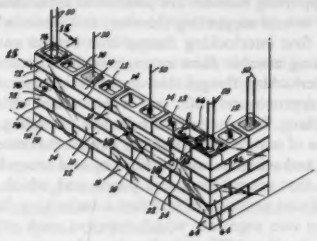
1. A molding for protecting and sealing a joint formed by the intersection of two surfaces from a fluid comprising:
an underlying longitudinal member;
means for affixing one longitudinal edge of the underlying longitudinal member to one of the two surfaces and means for affixing the other longitudinal edge of the underlying longitudinal member to the other of the two surfaces whereby the underlying longitudinal member spans the longitudinal joint;
an outer longitudinal member; and
spaced apart connecting members holding the outer longitudinal member spaced apart relation with the underlying longitudinal member and defining at least one channel through which the fluid may flow downwardly between the outer longitudinal member and the underlying longitudinal member away from the joint;
the outer longitudinal member being sized to substantially cover the underlying longitudinal member when the molding is mounted to span the joint which each longitudinal edge of the outer longitudinal member is spaced apart from the surface adjacent their respective edge.

4,091,587
CEMENT BLOCK WALL

Charles W. Depka, 4885 Hillside Dr., Carlsbad, Calif. 92008

Filed Feb. 14, 1977, Ser. No. 768,205
Int. Cl.[2] E04B *2/44*
U.S. Cl. 52—421 24 Claims

1. The improvement in a wall, comprising:
(a) said wall being formed by a multiplicity of cement blocks each having a pair of cells separated by a center tie wall, oppositely bounded by end tie walls, and having face shell side walls, the cell tapering from bottom to top and having handholds at the upper inner edges of said center tie wall, said blocks being laid in lower and upper courses and in end-to-end series in each course, each block of an upper course having each half resting on a different lower course block,
(b) interposed members preformed independently of said wall and installed separating courses of blocks and separating adjacent blocks in each course, there being not mortar between courses of blocks and between adjacent blocks in each course,
(c) each interposed member having a horizontal sheet-like portion and having integral therewith a vertical flange and each interposed member being associated with one upper course block with said horizontal portion extending substantially from end-to-end thereof and with said vertical flange connected to one end of said horizontal portion and lapping one end of the associated upper course block,
(d) said vertical flange including portions adjacent to the vertical outer surfaces of face shell walls of the associated block thereby having an appearance like a vertical mortar joint, and said horizontal portion extending to a location adjacent to the vertical outer surfaces of face shell walls of the associated block thereby having an appearance like a horizontal mortar joint,
(e) said horizontal portion having interengaging means to orient upper course blocks relative to lower course blocks

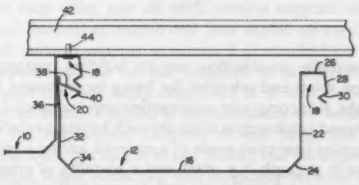


and to secure upper course blocks from lateral shifting relative to lower course blocks, said interengaging means of each horizontal portion engaging in the lower cell walls of the upper course block with which it is associated and engaging in the upper cell walls of the two cells below the horizontal portion which are of two different lower course blocks, the interengaging means having sufficient contacts with the engaged cell walls to accurately orient and to adequately secure the blocks involved, and
(f) said horizontal portions having openings therein extending throughout most of the areas common in plan view to cells of lower course blocks and to the cells of upper course blocks generally superposed thereto, and reinforcing rods in at least some of said generally vertically aligned cells of blocks in said wall and grout encasing said rods.

4,091,588
SPRING ACTION PANEL INTERLOCK

William C. Heirich, 2912 Wauhilah Dr., Muskogee, Okla. 74401

Filed May 18, 1977, Ser. No. 798,104
Int. Cl.[2] E04B *5/52*
U.S. Cl. 52—478 14 Claims



1. A paneling system, comprising a supporting member, a plurality of panels, each of said panels being provided with first and second interlocking flanges that are flexible, said first interlocking flanges having portions extending from said panels to said supporting member engaging said supporting member and then extending away from said supporting member terminating in ends spaced from said portions that extend from said panels, means fastening those portions of said first inter-

locking flanges that engage said supporting members to said supporting member, said second interlocking flanges having portions extending from said panels which engage only parts of said portions of said first interlocking flanges that extend from said panels and extending to the vicinity of said supporting member and then extending away from said supporting member toward said ends of said first interlocking flanges terminating in ends which engage said ends of said first interlocking flanges, said ends of said second interlocking flanges being spaced from said portions thereof which extend from said panels distances sufficient to force said ends of said first interlocking flanges outwardly until said second interlocking flanges are secured in place within said first interlocking flanges at which time said ends of said first interlocking flanges assume their original positions, and wherein said portions of said first interlocking flanges that extend from said panels to said supporting member are positioned approximately perpendicular to said supporting member, and wherein said portions of said first interlocking flanges that extend away from said supporting member form an angle with those portions of said first interlocking flanges that engage said supporting member that is approximately 90°, and wherein said ends of said first interlocking flanges terminate in lips extending toward said portions of said first interlocking flanges that extend from said panels, and wherein said portions of said second interlocking flanges that extend from said panels and which engage only parts of said portions of said first interlocking flanges are defined by two segments which intersect each other at angles slightly less than 180°, and wherein said portions of said second interlocking flanges which extend toward said ends of said first interlocking flanges are positioned diagonally from the points at which said portions of said first interlocking flanges engage said supporting member and said lips of said first interlocking flanges.

4,091,589

ELEMENT FOR BUILDING CONTRACTION OR EXPANSION JOINTS AND COMPOSITE UNIT OBTAINED WITH THIS ELEMENT

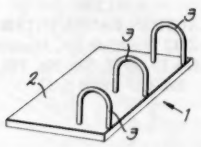
Willem H. Moot, Rhode-St-Genese, Belgium, assignor to S.I.P., s.p.r.l., Rhode-St-Genese, Belgium

Filed Dec. 28, 1976, Ser. No. 755,059

Claims priority, application Belgium, Jan. 8, 1976, 254748; Nov. 23, 1976, 255481

Int. Cl.² E04B *1/68*

U.S. Cl. 52—573 **5 Claims**



1. Composite construction unit for building contraction or expansion joints and intended for being incorporated in concrete slabs, said composite construction unit including a plurality of aligned construction elements each having a substantially quadrangular base plate made of a material having a relatively high tensile strength, e.g. steel, and a plurality of connecting reinforcements integrally secured to one half of the upper surface of said base plate, said connecting reinforcements being intended to be incorporated in said concrete slabs, said aligned construction elements being positioned in such a way that their connecting reinforcements are staggered and said aligned construction elements being secured to each other by a plurality of linking elements, said connecting reinforcements being arranged in rows and one said linking element being provided per row, each said linking element including at least one linking member, the linking elements forming a linking member being linked together by bushings.

4,091,590

STRUCTURAL ELEMENT

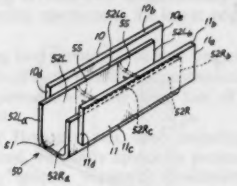
Hirokazu Miura, 536, Kamiumamachi, Shibutani-dori Higashiyama-ku, Kyoto, Japan

Filed Jun. 7, 1977, Ser. No. 804,281

Claims priority, application Japan, Jun. 12, 1976, 51-68896; Jul. 14, 1976, 51-84256; Oct. 29, 1976, 51-130592; Jan. 19, 1977, 52-5091

Int. Cl.² E04C *1/10*

U.S. Cl. 52—585 **23 Claims**



1. A structural element for use as a component part of a building, comprising: a pair of parallel side plates having opposite surfaces spaced a predetermined distance apart from each other; and connecting means disposed between said opposite surfaces so as to rigidly connect and keep said side plates in said spaced-apart relation, said connecting means comprising a channel member of a substantially U-shaped cross section having substantially the same length of said side plates, said channel member comprising a pair of opposite side walls and a base plate connecting said side walls, the outer surfaces of said side walls being fixed to the inner surfaces of said side plates.

4,091,591

HEAT-INSULATING PANEL

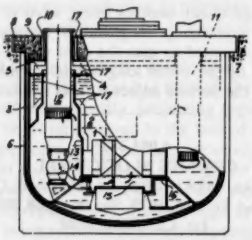
Guy Lemercier, Le Puy Ste Reparade, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jun. 3, 1976, Ser. No. 692,528

Claims priority, application France, Jun. 16, 1975, 75 18767

Int. Cl.² E04C *2/08*

U.S. Cl. 52—613 **7 Claims**



1. A leak-tight heat-insulating panel comprising a flat enclosure which is capable of being applied against a wall to be protected, said enclosure being delimited by two thin sheet-metal sealing elements extending in parallel relation and welded together at their periphery so as to form between them an enclosed space filled with an inert gas, an alternate stack of wire-fabric elements and perforated plates mounted within said enclosed space and extending in a direction parallel to the thin sheet-metal sealing elements, the free spaces between the wire-fabric elements and the perforated plates communicating with each other, providing free movement of said inert gas throughout the entire enclosed space in said panel, said plates being pierced by holes uniformly spaced in the plane of said plates except in the peripheral region thereof in order to permit a leak-tight welded joint between said plates and said thin sheet-

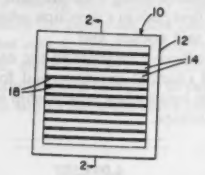
metal sealing elements, the thickness of said plates being greater than that of said wire-fabric elements.

4,091,592

LOW HEAT TRANSFER, HIGH STRENGTH WINDOW MATERIALS

Abraham L. Berlad, Stony Brook; Francis J. Salzano, Patchogue, and John E. Batey, Stony Brook, all of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 29, 1977, Ser. No. 792,173
Int. Cl.² E04C 2/34
U.S. Cl. 52—616 **12 Claims**



1. A window effective in permitting the passage of radiant energy there-through while reducing heat flow by way of convection comprising:

(a) a plurality of coextensive panes of a material substantially transparent above the infrared region;

(b) means for holding said panes in a spaced apart essentially parallel relationship and forming a space therebetween; and,

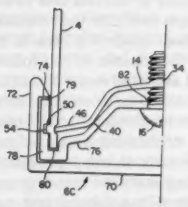
(c) convection defeating means between at least one adjacent pair of said panes for dividing the space between said pair of panes into spaces having a critical dimension sufficiently small to prevent the development of free convection currents, for an appropriate set of design conditions, while allowing a maximal transmittance of radiant energy, said convection defeating means essentially spanning the space between said panes.

4,091,593

PANEL ASSEMBLY INCLUDING SIDE CAPS AND PANEL RETAINING MEANS ASSOCIATED THEREWITH

Anthony R. Mennuto, 769 Pascack Rd., Paramus, N.J. 07652

Filed Jan. 28, 1977, Ser. No. 763,245
Int. Cl.² E04C 2/36
U.S. Cl. 52—620 **13 Claims**



1. For panel assemblies of the type including a pair of panels arranged in spaced relation, combined side cap and panel retaining means comprising:

a pair of longitudinally extending side caps;

corresponding edges of each of the pair of panels disposed within one of the pair of side caps and the opposite corresponding edges of each of the pair of panels disposed within the other of the pair of side caps, said panels thereupon being in the spaced relation;

a plurality of retaining means disposed along the one and the other side caps and supported thereby, each of which retaining means includes a resilient retainer intermediate the corresponding panel edges disposed with said side caps;

a corresponding plurality of operator adjustable means in cooperative relation with the one and the other side caps and the resilient retainers, and adjusted to spread the retainers for abutting the corresponding panel edges disposed within said side caps for retaining the panels in the spaced relation;

the one and the other side caps each include an inwardly extending wedge having end portions terminating in slots and a centrally disposed clearance hole;

the corresponding edges of each of the pair of panels disposed within the one of the pair of side caps being received by the slots in said one side cap, and the opposite corresponding edges of each of the pair of panels disposed within the other of the pair of side caps being received by the slots in said other side cap;

the resilient retainers being supported by the wedge intermediate the corresponding panel edges disposed within the one and the other side caps, said retainers including a centrally disposed threaded hole in substantial alignment with the clearance hole in the wedge; and

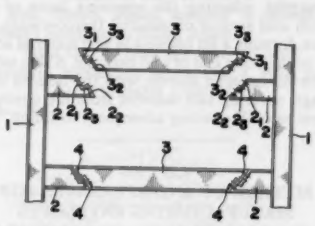
each of the operator adjustable means includes an adjustable screw extending through the wedge clearance hole and in threaded engagement with the threaded retainer hole, and adjusted to spread the retainer.

4,091,594

STRUCTURE FOR CONVECTING PARALLED SPACED VERTICAL SUPPORTS

Yujiro Yamashita, 9 Daimon-cho, Nishikyogoku Ukyo-Ward Kyoto-Prefecture, Kyoto City, Japan

Filed Oct. 4, 1976, Ser. No. 729,606
Int. Cl.² E04C 3/30
U.S. Cl. 52—721 **3 Claims**



1. A structure for connecting parallel, spaced vertical supports comprising:

two first beams aligned with each other and attached opposite each other one on each vertical support, each first beam having an angled end face angled upward toward said vertical support to which it is attached on the end thereof opposite the end attached to said support, said angled end face being comprised of at least two parallel angled surfaces angled at approximately 60° with respect to the longitudinal direction of said beam and a third surface at right angles to and joining said parallel surfaces;

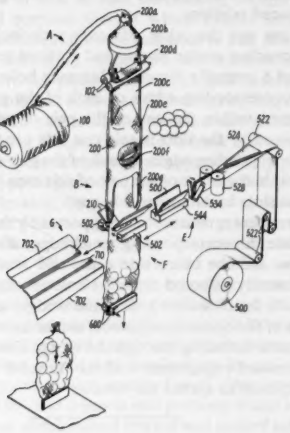
a second beam contacting and extending between said angled end surfaces of said first beams, said second beam also having a plurality of parallel angled surfaces at the ends thereof angled correspondingly to said angled surfaces of said first beams, whereby said angled end surfaces of said second beam rest directly against the said angled surfaces of said first beams; and

fastening means between said contacting end surfaces of said first and second beams for fastening said contacting surfaces together.

4,091,595
NETTING BAG MACHINE AND METHOD

Edwin Joseph Pelster, Pleasanton; Richard Franc Kipers, Danville, and George Earl Kilner, Oakland, all of Calif., assignors to Filper Corporation, Reno, Nev.

Filed Jul. 15, 1976, Ser. No. 705,654
Int. Cl.[2] B65B *61/00, 9/14*
U.S. Cl. 53—14 44 Claims

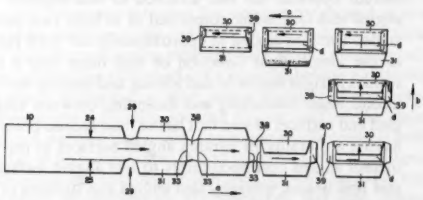


1. A method for forming and filling packages from tubular packaging material in a continuous supply comprising the steps of: forming the open end of said tubular material into a hollow configuration generally defining a package shape, clamping the open end of said material to define a generally flat outwardly extending section of said material, positioning a "V"-shaped elongate label closure about the outwardly extending section of said material, adhering the opposing faces of said label closure with said section of material therebetween to form a first closure, forming a fill opening in said material adjacent the desire site of the other end of said package, filling said material through the fill opening therein with the desired contents of said package, severing said material from the continuous supply adjacent said fill opening subsequent to filling.

4,091,596
METHOD OF AND APPARATUS FOR MANUFACTURING ENVELOPES

Charles L. Jones, Ledyard, Conn., assignor to EnMail Machine Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 689,936, May 25, 1976, abandoned, which is a continuation of Ser. No. 551,723, Feb. 21, 1975, abandoned. This application Jun. 24, 1976, Ser. No. 699,301
Int. Cl.[2] B65B *11/48*
U.S. Cl. 53—31 20 Claims



1. A method of forming envelopes from a continuous paper web and for incorporation of insert material into the envelopes during their formation comprising the following steps:

(a) intermittently advancing along a first path a paper web comprising defined envelope blanks having a bottom flap on one side of said web, a closure flap on the opposite side of said web, at each end thereof;

(b) folding each of said bottom flaps to form a pocket during advance of said web;

(c) stopping the advance of said web at a predetermined position;

(d) severing the leading envelope blank from said web;

(e) charging insert material into the pocket defined by the bottom flap of said severed envelope blank while restraining said severed envelope blank;

(f) urging the bottom flap of said charged envelope blank into overlying relationship with the inserted material;

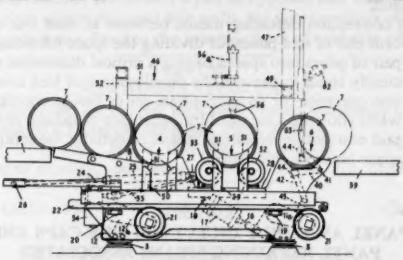
(g) advancing said charged envelope blank from said predetermined position along a second path which is perpendicular to said first path in a direction which is opposite to the opening of said pocket; and

(h) applying adhesive material to the end flaps and closure flap of said charged envelope and folding said end and closure flaps into sealing relationship to form a completed charged envelope.

4,091,597
ORIENTING AND FILLING CASKS

Gordon Francis Sanderson, Hunters Hill, and Anthony George Burge, Dundas, both of Australia, assignors to Automation Feeding Devices Pty Limited, Rydalmere and Tooheys Limited, Sydney, both of, Australia

Filed Jun. 11, 1976, Ser. No. 695,082
Claims priority, application Australia, Jun. 17, 1975, PC2008
Int. Cl.[2] B65G *47/24*
U.S. Cl. 53—59 R 11 Claims



1. A cask orienting, filling and shive inserting machine, said machine having a rest station, a filling station and an intermediate orientation station for casks; advancing means to simultaneously elevate casks in the rest and orientation stations and advance them respectively to the orientation and filling stations; ejection means to eject a cask in the filling station in timed relation to the transfer of the following cask from the orientation station and in advance of said following cask arriving at the filling station; an orientation means; means to rotate the cask about its longitudinal axis while at the orientation station until said orientation means engages in a peripheral shive hole in the cask thereby preventing further rotation thereof, a cask filling and shive inserting means for the oriented cask located at the filling station, said cask filling and shive inserting means comprising a racking spear; an extensible and contractable assembly to introduce the spear through the shive hole of the oriented cask at the filling station; sealing means on the spear to sealingly engage the exterior of the cask around the shive hole; gas delivery means on the racking spear to pass compressed gas therethrough; liquid delivery means on the racking spear to pass liquid therethrough; first detector means on the racking spear to detect gas pressure in a cask to be filled with liquid; second detector means on the racking spear to detect liquid level in a cask being filled; pressure equalising means to open at a predetermined pressure to connect the

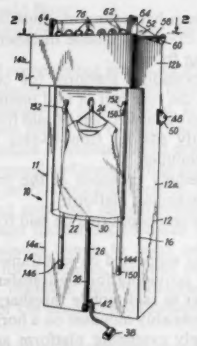
pressurized interior of the cask with a pressurized header tank of liquid connected to the liquid delivery means and to close when the pressure in the cask drops below said predetermined pressure; first valve means to regulate the flow of liquid the opening of which is controlled by the first detector means and the closing of which is controlled by the second detector means; second valve means to shut off the flow of gas to the cask controlled by the first detector means; the first control means incorporating said first and second detector means being operable to actuate said extensible and contractable assembly to lower said racking spear into the cask and to engage the sealing means on the cask to admit gas to the cask and said assembly being operable after filling of the cask to withdraw the spear by contraction of said extensible and contractable assembly; and shive storing and delivery means to store and then position one shive for each cask that has been filled over the shive hole of that cask in timed relation to the withdrawal of the racking spear, and means to control the re-extension of the extensible and contractable assembly to engage the racking spear with the shive and to force the shive into the shive hole of the filled cask.

4,091,598

SEMI-AUTOMATIC BAGGING MACHINE

Vincent N. Vulcano, New York, N.Y., and Maurice W. Friedman, 548 Barnard Ave., Woodmere, N.Y. 11598, assignors to Maurice W. Friedman, Woodmere, N.Y.

Filed Sep. 10, 1976, Ser. No. 721,957
Int. Cl.² B65B *5/02, 43/30*
U.S. Cl. 53—241 **6 Claims**



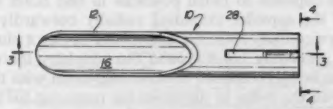
1. In a bagging machine for sequentially forming individual bags for clothing garments comprising a supply means for supplying a continuous, tubular bagging material having a leading edge defining an open end for the bag, a garment support means for supporting a garment to be bagged for insertion of the garment into the tubular bagging material through the open end of the bag, guide means for establishing a path for the tubular bagging material from the supply means to the garment support means, and means selectively operable for providing a transverse seal between the opposite faces of the tubular bagging material and for at least partially severing the tubular bagging material adjacent the seal so that when the tubular bagging material is pulled over the garment the material forms a bag for the garment and a new open end for the next bag the improvement comprising means for untangling the tubular bagging material and for spreading and maintaining apart the opposite faces of the tubular bagging material including a plurality of hollow spherical balls, each of said balls having a plurality of perforations and being disposed within the tubular bagging material and supported by said guide means for individual rotation of each of the balls within the tubular bagging material.

4,091,599

COIN COUNTING AND PACKAGING DEVICE

Roger Joseph Lemieux, 91 Sommervale Ave., Pointe Claire, Quebec, Canada (H9R 3H6)

Filed Jun. 16, 1977, Ser. No. 807,048
Int. Cl.² B65B *39/00, 67/02*
U.S. Cl. 53—254 **8 Claims**



1. A portable coin counting and packaging device for use with a tubular wrapping medium comprising:

a hollow tubular body of substantially circular cross-section adapted to receive coins of a predetermined denomination,

said tubular body having at its receiving end a portion thereof removed along its longitudinal axis to form a scoop of substantially semi-circular cross-section, and having at its other end stopper means, a portion of which protrudes within said tubular body,

said protruding portion of said stopper means having a diameter less than the inside diameter of said tubular body to provide a space there between,

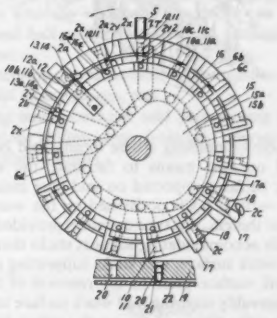
said portion of said tubular body between the end of said semi-circular scoop and the end of said protruding stopper means defining a chamber for holding a prescribed number of coins and when full, constituting self-counting means.

4,091,600

ROTARY CAPSULE DIRECTION ARRANGING AND FILLING EQUIPMENT

Toshiharu Itoh, Osaka, Japan, assignor to Kabshiki Kaisha Osaka Jidoki Seisakusho, Sakai, Japan

Filed Oct. 4, 1976, Ser. No. 729,604
Claims priority, application Japan, Feb. 4, 1976, 51-11665
Int. Cl.² B65B *1/04, 43/40*
U.S. Cl. 53—282 **4 Claims**



1. Rotary capsule direction arranging and filling equipment, comprising: a capsule feeding device having a horizontally rotating means and vertically depending capsule aligning means depending therefrom for feeding randomly oriented capped empty capsules supplied in bulk to said horizontally rotating means to said vertically depending capsule aligning means for vertically aligning capsules in at least one vertical column with the caps of the capsules up or down; at least one drum means rotatably mounted for rotation around a horizontal axis and having a plurality of radial capsule receiving holes

around the periphery thereof, the drum means being positioned beneath said vertically depending capsule aligning means with the holes around the periphery aligned for receiving capsules from the vertically depending capsule aligning means, said drum means including reorienting means therewithin for reorienting the capsules received in said radial holes from a radial direction on said drum to a circumferential direction with the caps of the capsules all facing in the same circumferential direction and for further reorienting the circumferentially positioned capsules to radial positions in said holes with the bodies of the capsules extending radially outwardly of said drum; a horizontally rotatable disk means having a plurality of vertically extending holes around the periphery thereof, said disk means being positioned beneath said drum with the holes aligned with the holes in the drum for receiving the capsules from the holes in the drum as the holes in the drum move past the lowermost portion of the periphery of the drum and moving them around the periphery of said disk means in at least one row with the capsules upright and with the caps of all the capsules on the tops of the upright capsules; a capsule filling means having a horizontally rotatable plate having the periphery passing beneath the periphery of said disk means and having a plurality of capsule receiving holes therein for receiving the upright capsules in the holes in said disk means and having means for removing the caps from the capsule bodies, filling the capsules with a material, and replacing the caps on the capsule bodies; and means for driving said capsule feeding device, said drum, said disk means and said capsule filling means in synchronism for transferring capsules through said equipment.

4,091,501

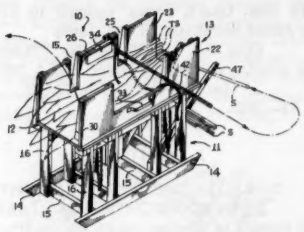
WORK TABLE

James L. Riggins, Star Route, Mintonville, Casey County, Ky. 42542

Filed Jul. 22, 1976, Ser. No. 707,646

Int. Cl.[2] **A01D** *39/00;* **B65B** *13/08;* **B24B** *1/10;* **B60P** *1/28*

U.S. Cl. 53—390 **3 Claims**



1. A work table comprising a base means, said base means being mounted on skid means to facilitate the movement thereof, a work surface supported on said base means, oppositely disposed vertical walls positioned on the work surface cradling material therein, slot type openings provided in one of the vertical walls accommodating support sticks therein transversely to said work surface, said sticks supporting said material on said work surface prior to the removal of the sticks, pivot means removably securing said work surface to said base means permitting the tilting of the work surface in either of two directions with respect thereto by disposing the pivot means in either of two positions with said work surface being movable to a substantially vertical position whereby the material can be discharged therefrom, handle means on one of said walls facilitating the tilting of the work surface, said pivot means being comprised of openings in said base means aligned with openings provided on the work surface with pins extending therethrough, limiting means removably positioned between the base means and work surface limiting the movement of the work surface to either of the vertical positions, an angled support extending outwardly from said base means receiving said sticks after the material is removed therefrom, a string receptacle means mounted on said base means housing a supply of string, and a string retaining means mounted on one of said walls and a cutter mounted within the other wall for cutting said string, whereby the string is threaded from said supply means through said retention means onto said surface and thereafter placed against said knife surface for severing purposes after the material has been bunched and tied.

4,091,602

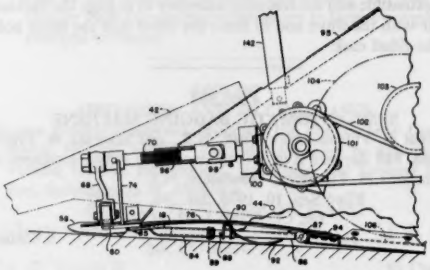
CROP HARVESTING MACHINE WITH FLEXIBLE CUTTER BAR

Millard M. Williams, and Robert A. Stelzer, both of Celina, Ohio, assignors to Avco Corporation, Coldwater, Ohio

Continuation-in-part of Ser. No. 614,400, Sep. 18, 1975, abandoned. This application Jan. 10, 1977, Ser. No. 757,957

Int. Cl.[2] **A01D** *55/32*

U.S. Cl. 56—14.4 **11 Claims**



1. A grain and bean harvesting machine intended for transverse mounting in front of a mobile thresher, comprising:

a main supporting frame;

a transversely extending platform for collecting severed crop cuttings, the rear half of said platform being rigidly supported from the lower part of said frame, said rear half having a gently sloping front-to-rear contour without abrupt discontinuities;

a cutter bar assembly mounted at the front edge of said transversely extending platform;

a rotating cross auger supported on said frame at the rear of said platform;

a feeder conveyor supported on said frame aft of said auger, said conveyor providing for the transfer of crop cuttings from said auger to said mobile thresher;

a reel assembly rotatably mounted on a horizontal axis above said transversely extending platform adjacent the front thereof, said assembly including adjustable support arms for attaching said reel assembly to said frame; and

flexible means mounting said cutter bar assembly in cantilevered fashion at the leading edge of said transversely extending platform, said flexible means including a multiplicity of spaced apart leaf springs having their front ends affixed to said cutter bar assembly and extending rearwardly to attachment points on said main supporting frame, said leaf springs having a constant taper being widest at the attachment point to said main frame, said constant taper assuring that said leaf springs flex up and down along an arc of substantially constant radius from said cutter bar assembly to their attachment points on said main frame,

a set of stabilizer bars interspersed with said leaf springs, one end of each stabilizer bar being attached to the cutter bar, the other end of each stabilizer bar being pivotally attached to the main frame, each stabilizer member being lengthwise compressible and serving to stabilize the up and down flexing of its respective region of said cutter bar,

a flexible skin covering said leaf springs and comprising the front half of said transversely extending platform, said

flexible skin extending from said cutter bar to the main frame support adjacent the auger.

4,091,603

DEVICE FOR COMPRESSING AGRICULTURAL CROP INTO A BUNCH

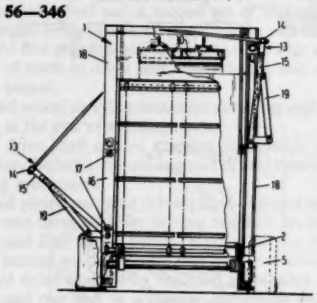
Pieter Adriaan Oosterling, and Hendrik Vissers, both of Nieuw-Vennep, Netherlands, assignors to Vicon N.V., Nieuw-Vennep, Netherlands

Filed Sep. 24, 1975, Ser. No. 616,201

Claims priority, application Netherlands, Sep. 27, 1974, 7412864

Int. Cl.[2] A01D *87/04*

U.S. Cl. 56—346 13 Claims



1. Apparatus for compressing a large quantity of crop into a bunch, comprising in combination:

a holder having a floor and upstanding side wall portions surrounding said floor;

means for feeding the crop into said holder to accumulate therein;

first and second compressing means for alternately but overlappingly compressing the crop to form said bunch as the crop is progressively accumulated in said holder, and including drive means for causing said first compressing means to maintain a predetermined compression force on a partially accumulated bunch while said second compression means is establishing compression on further accumulated crop and until said second compressing means has compressed said further accumulated crop and said partially accumulated bunch to exert said predetermining compression force thereon, and vice versa, whereby continuously to maintain said predetermined compression force on all of the crop so accumulated and compressed; and

means for discharging compressed crop from the holder as said bunch when said large quantity has been accumulated and compressed.

4,091,604

DEVICE FOR THE DRIVING OF YARN-TAKEUP PACKAGES, ESPECIALLY FOR DOUBLE TWISTING MACHINES

Aloys Greive, Munster, Germany, assignor to Hamel GmbH, Zwirnmaschinen, Munster, Germany

Filed Mar. 31, 1977, Ser. No. 783,491

Claims priority, application Germany, Apr. 1, 1976, 2614103

Int. Cl.[2] D01H *1/10, 1/20;* B65H *54/42*

U.S. Cl. 57—34 R 9 Claims

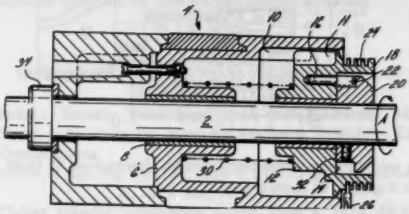
1. A device on a twisting machine, especially a double twister, for peripherally driving a yarn package to take up a twisted yarn, said device comprising:

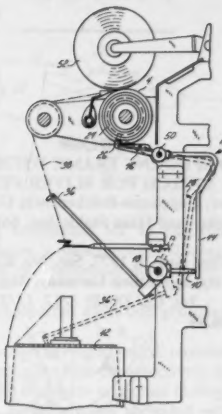
a drive shaft;

a coiling cylinder for each twisting station of the machine coaxial with said drive shaft and freely rotatable thereon, a respective yarn package resting upon said coiling cylinder and being peripherally rotated thereby, said coiling cylinder being axially fixed relative to said shaft;

a coupling sleeve angularly engaged by said coiling cylinder and freely rotatable on said shaft;

a hub axially fixed on said shaft and rotatably entrained therewith, said sleeve being axially shiftable relative to said coiling cylinder and said shaft toward and away from said hub, said hub and said sleeve being provided with mutually engageable formations to angularly couple said sleeve with said hub in an operative axial position of said sleeve whereby said coiling cylinder is entrained by said





shaft and being disengaged in another position of said sleeve whereby said coiling cylinder can come to standstill and halt rotation of the yarn package resting thereagainst;

thread-sensing means monitoring the tension of a yarn coiled on said yarn package; and

actuating means between said yarn-sensing means and said sleeve for shifting same from said operative position into said other position.

4,091,605

METHOD AND APPARATUS FOR THE TWISTING OF YARN

Alan Nicholas Jacobsen, 48 Stephenson St., Richmond, Victoria, Australia

Filed Feb. 16, 1977, Ser. No. 769,092

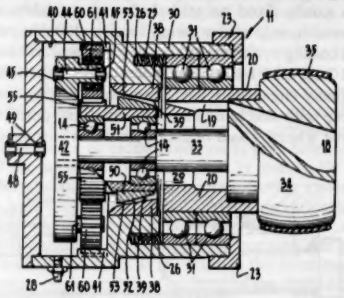
Claims priority, application Australia, Feb. 23, 1976, 4950/76

Int. Cl.[2] D01H *1/12*

U.S. Cl. 57—58.89 15 Claims

9. Apparatus for spinning yarn comprising a member having a surface of revolution, means to present an assembly of fibres as an open end continuous stream to one axial end of said surface of revolution, means operable to draw said assembly of

fibres across said surface from said one axial end to an opposite axial end thereof, and means to cause said assembly to roll



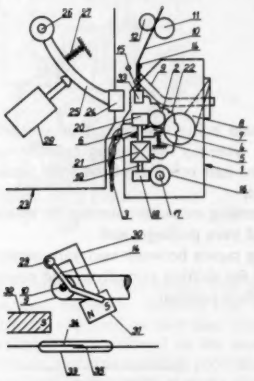
upon said surface while being drawn thereacross to twist the fibres together to form a yarn.

4,091,606

OPEN END SPINNING FRAME WITH A MAGNETIC SWITCH FOR SLIVER FEED

Dieter Böttcher, Deggingen-Reichenbach, Germany, assignor to Fritz Stahlecker and Hans Stahlecker, both of, Germany, 03 DT

Filed Aug. 9, 1977, Ser. No. 823,199
Claims priority, application Germany, Aug. 16, 1976, 2636845
Int. Cl.[2] D01H *1/12, 13/16*
U.S. Cl. 57—58.89 9 Claims



1. Spinning machine apparatus comprising:

a yarn sensor disposed in the region of a yarn takeoff passage of an open-end spinning unit or the like,

an electric magnetic switch operatively disposed in an electric circuit to control the switching on and off of a device for feeding sliver to the spinning unit,

a sensor magnet connected with said yarn sensor for controlling said magnetic switch in dependence on the position of the yarn sensor,

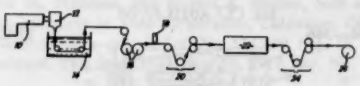
and an auxiliary magnet, separate from said sensor magnet, for switching on said magnetic switch to effect a supply of sliver for a piecing process at said spinning unit, said auxiliary magnet including poles which face poles of like polarity of said sensor magnet when said sensor is in a switched off position.

4,091,607

TWINE AND METHOD OF FORMING SAME

Anthony Frank Aspin, Knutsford, England, assignor to Aspin Shaw, Ltd.; Francis Shaw & Co. Ltd. and Pakord Ltd., all of, Great Britain

Filed July 22, 1976, Ser. No. 707,657
Claims priority, application United Kingdom, Jul. 29, 1975, 31591/75
Int. Cl.[2] D02G *3/06;* B29D *7/14*
U.S. Cl. 57—140 R 12 Claims



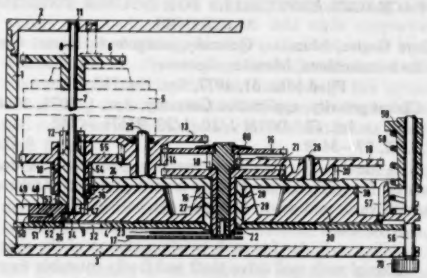
1. In a process for making fibrous material from film of the type described which includes the steps of simultaneously heating and embossing the film to form a plurality of parallel longitudinal enlarged portions connected by alternate, relatively fragile, parallel longitudinal portions, and drawing the film to a fibrillatable state, the improvement wherein the temperature of the film during embossing is substantially lower than that which would conventionally be employed, but not so low as to give rise to brittleness of the film and consequent mechanical fracture under processing stresses.

4,091,608

TIMER CLOCK

Bernhard Kratz, Nuremberg, and Erwin Potthof, Rothenbach, Peg, both of Germany, assignors to Firma DIEHL, Nuremberg, Germany

Filed Apr. 4, 1977, Ser. No. 784,508
Claims priority, application Germany, Apr. 13, 1976, 2616248
Int. Cl.[2] G04F *3/02*
U.S. Cl. 58—22.9 19 Claims



1. In a timer clock of the type having a time-of-day record-

ing mechanism, switch means electrically connectible to an electric device, adjustable timer means for controlling said switch means, and power means operably connected to drive said time-of-day recording mechanism and said timer means; said timer means having means defining a first timing period and means defining a second timing period which is more extended than said first timing period, said power means including a motor and a drive shaft driven by said motor; said drive shaft carrying first gear means adjacent one end thereof for actuating said second timing period defining means; the improvement wherein:

said timer means comprises a rotatably mounted wheel, said first and second timing period defining means comprising, respectively, a first set of circumferentially arranged teeth on said wheel and a second set of circumferentially arranged teeth on said wheel following said first set of teeth;

said first gear means being engageable with said second set of teeth to drive said wheel during said second timing period;

said wheel carrying means for actuating said switch means at the end of a timing cycle;

said drive shaft carries a pinion engageable with a second gear, the latter comprising part of said time-of-day recording mechanism;

said pinion carrying drive means adjacent said one end of said drive shaft for driving said first set of teeth during said first timing period, preceeding the driving of said second set of teeth by said first gear means;

said drive shaft being mounted at its other end, opposite said one end, in a manner permitting swinging movement of said one end relative to said wheel.

4,091,609
DIGITAL ELECTRONIC TIMEPIECE

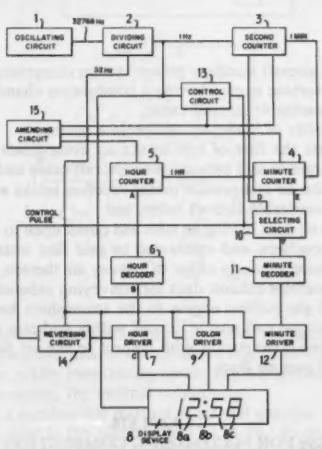
Takehiro Ishikawa, and Yuji Koike, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Dec. 6, 1976, Ser. No. 747,529

Claims priority, application Japan, Dec. 4, 1975, 50-144640; Dec. 19, 1975, 50-151657

Int. Cl.² G04C *3/00*; G04B *19/30*

U.S. Cl. 58—23 R **2 Claims**



1. A digital electronic timepiece comprising in combination; an oscillating circuit for generating a time standard signal, a dividing circuit for dividing said time standard signal to produce a drive pulse of selected frequency, second, minute and hour counters connected serially to each other and receiving and counting said drive pulse to provide counts of seconds, minutes and hours respectively, first display means for digitally displaying said hour count, a first decoder driver connected between said hour counter and said hour display means, second display means for alternatively digitally displaying said seconds count and said minutes count, a second decoder driver for said second display means, a selecting circuit for alternately connecting said seconds counter and said minutes counter with said second decoder driver, and a control circuit receiving pulses from said driving circuit and controlling said selecting circuit periodically to connect said second decoder driver alternately with said seconds counter and said minutes counter to display the seconds count and the minutes count alternately a selected intervals by said second display means.

4,091,610
SWITCHING MECHANISM FOR ELECTRONIC WRISTWATCH

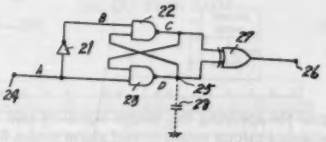
Takehiko Sasaki, Yamatokoriyama, and Hidetoshi Maeda, Tenri, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 575,731, May 8, 1975. This application Jan. 6, 1977, Ser. No. 757,142

Claims priority, application Japan, May 8, 1974, 49-51456; Jul. 4, 1974, 49-77029

Int. Cl.² G04C *3/00*

U.S. Cl. 58—23 R **4 Claims**



1. A switching mechanism for an electronic wristwatch including an oscillator, a main circuit, a display unit, a casing, a rear frame made of conductive material and a front glass, comprising:

a. a thin-film transparent electrode provided on the front glass;

b. a switching circuit having a control terminal connected to said transparent electrode for selectively interconnecting said transparent electrode to ground through stray capacitance and an input terminal provided with an enabling signal from said main circuit and providing an output control signal in response to such selective interconnection; and

c. a control circuit for controlling an operation mode of the electronic wristwatch in response to said output control signal from the switching circuit;

said switching circuit comprising an RS flip-flop having first and second output terminals, one of which comprises said control terminal and an exclusive OR gate connected at its input to said first and second output terminals and having an output terminal for carrying said output control signal.

4,091,611
DIGITAL ALARM WATCH

Takuro Fukuichi, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Oct. 12, 1976, Ser. No. 731,707

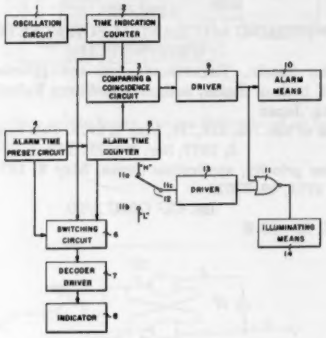
Claims priority, application Japan, Oct. 13, 1975, 50-123010; Oct. 13, 1975, 50-123012

Int. Cl.² G04C *21/00*; G04B *19/30, 23/12*

U.S. Cl. 58—57.5 **3 Claims**

1. A digital alarm watch comprising, in combination: time standard circuit means for generating a repetitive signal which defines a time standard; time counter means connected to receive the repetitive signal for counting the same to develop a cumulative count representation of time; alarm time circuit means for storing a signal representative of a time that an alarm signal is to be emitted; comparing and coincidence circuit means connected to receive the cumulative count of said time

counter means and the signal stored in said alarm time circuit means for comparing the same and for developing an output signal when the count of said time counter means and the stored signal of said alarm time circuit means coincide; display means for displaying selectively the time represented by the count of said time counter means and the time represented by the signal stored in said alarm time circuit means; alarm means enabled by the output signal of said comparing and coincidence circuit means for emitting an alarm signal when enabled; illuminating means enabled by a control signal for emitting light when enabled; and control circuit means responsive to an



input signal for applying the output signal of said comparing and coincidence circuit means to said alarm means for enabling said alarm means, and for applying an enabling signal to said illuminating means in response to the input signal of said control circuit means when no output signal is developed by said comparing and coincidence circuit means, and for interrupting an enabling signal applied to said illuminating means when said comparing and coincidence circuit means develops an output signal during application of an input signal to said control circuit means to prevent said alarm means and said illuminating means from being simultaneously enabled, and to disenable said illuminating means when said alarm means is enabled.

4,091,612

ADJUSTING ARRANGEMENT FOR A DIGITAL INDICATOR

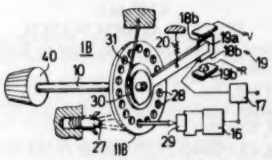
Alfred Meisner; Werner Arnold, both of Nuremberg, and Peter Ennen, Allersberg, all of Germany, assignors to Firma DIEHL, Nuremberg, Germany

Filed Sep. 3, 1976, Ser. No. 721,467

Claims priority, application Germany, Nov. 9, 1975, 2540486; Jun. 6, 1976, 2628794; Aug. 16, 1976, 2628899

Int. Cl.² G04B *27/00*; G04C *3/00*

U.S. Cl. 58—85.5 **34 Claims**



1. In an electric instrument of the type which includes a digital indicator and first pulse generating means electrically connected to said digital indicator for normally continually operating said digital indicator, an electro-mechanical digital indicator adjustment means including a second pulse generator actuable by a manually operable operating member for adjusting said digital indicator, said second pulse generator comprising:

means for producing electric pulses connectable electrically to said digital indicator for supplying such pulses thereto;

sensor means operably connectable to said pulse producing means to deliver activating signals thereto for the production of electrical pulses; and

a pulse control member including a plurality of pulse-producing elements arranged in a circular path and operably associated with said sensor means to control the delivery of activating signals to said pulse producing means;

one of said sensor means and said pulse control member being rotatable relative to the other at selective speeds by said manually operable operating member such that activating signals are generated in response to such relative rotation and are generated at a rate proportional to the relative rotational speed between said pulse control member and said sensor means.

4,091,613

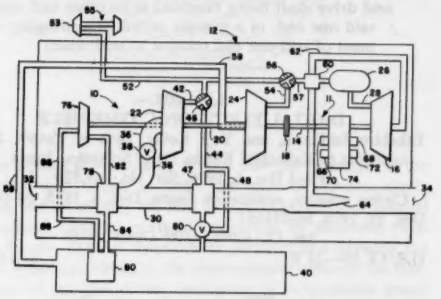
INDEPENDENT POWER GENERATOR

Richard N. Young, Yorktown, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 30, 1976, Ser. No. 710,036

Int. Cl.² F02C *7/00, 7/26*

U.S. Cl. 60—39.07 **14 Claims**



1. An aircraft auxiliary power system comprising

a gas turbine engine having a combustion chamber,

a pressurizable aircraft cabin,

a plurality of intake air compressor means,

wherein the first of said intake air compressor means discharges to said pressurizable aircraft cabin and the second intake air compressor means receives intake air from said pressurizable aircraft cabin, and

a ram air duct having an inlet and outlet open to the ambient atmosphere, and connected to said first intake air compressor means in order to convey air thereto;

a gas turbine exhaust duct for conveying exhaust gases from said gas turbine engine to the atmosphere having an exhaust gas exit nozzle located within said ram air duct and facing downstream with respect to the air flow through said ram air duct.

4,091,614

PROCESS FOR MAXIMIZING COMBUSTION OF FUELS

Arnold Marcel Leas, 309 E. Van Buren, Columbia City, Ind. 46725

Filed Sep. 9, 1976, Ser. No. 721,730

Int. Cl.² F02C *3/20*

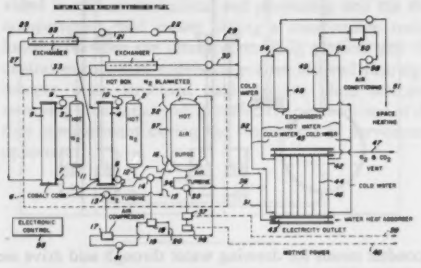
U.S. Cl. 60—39.02 **8 Claims**

1. In a process for combustion of a fuel with oxygen employing multiple combustion stages to form a combustion product wherein the heat of combustion is recovered by waste heat steam generation the improvement which comprises:

(a) heating fuel gas and oxygen prior to combustion of said

fuel gas with said oxygen by heat exchange thereof with said combustion product; and,

(b) effecting combustion of said preheated fuel gas with said preheated oxygen present in an amount of from about the stoichiometric amount required for combustion to about 5% in excess of the stoichiometric amount required for



combustion, said combustion being effected at a temperature of from about 1500° F to about 2500° F and in the presence of steam and a metal oxide selected from the group consisting of iron or cobalt oxide, whereby metal oxide is reduced by said fuel to metallic form and,

(c) regenerating said metallic iron or cobalt to form iron oxide or cobalt oxide.

4,091,615

INTERNAL COMBUSTION ENGINE WITH PLURAL SPARK PLUGS FOR EACH COMBUSTION CHAMBER AND EXHAUST RECIRCULATION CIRCUIT

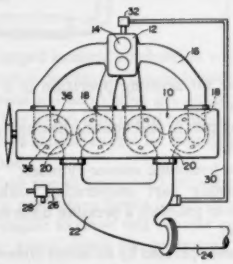
Yoshimasa Hayashi, Yokohama; Hiroshi Kuroda, Tokyo; Yasuo Nakajima, and Tooru Yoshimura, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Ltd., Japan

Filed May 14, 1976, Ser. No. 686,529

Claims priority, application Japan, May 22, 1975, 50-61275; May 27, 1975, 50-63726

Int. Cl.² F02M *25/06*

U.S. Cl. 60—274 **7 Claims**



5. A method of suppressing the emission of nitrogen oxides from an automotive internal combustion engine of the spark ignition type while maintaining stable engine operation and good fuel economy, the method comprising:

supplying a combustible mixture of air and gasoline with an air/fuel ratio in the range from 13:/ to 16:/ by weight to said each combustion chamber through an induction passage;

recirculating a portion of the exhaust gas of the engine to said induction passage through a recirculation passage;

controlling the quantity of the recirculated exhaust gas in dependence on the quantity of air drawn into combustion chambers of the engine, such that the quantity of the recirculated exhaust gas is maximized within the range from 12 to 40% by volume of said quantity of air while the engine speed is in a medium range and the output torque of the engine relative to the engine speed is not less than a value corresponding to a road-load condition without causing a further increase under lower load conditions; by utilizing a valve positioned in a venturi section of said recirculation passage to produce a flow velocity of gas in said passage equal to the speed of sound when the pressure difference across the venturi passage is at least 120 mmHg, and

igniting a compressed mixture of said combustible mixture and the recirculated exhaust gas in each combustion chamber of the engine by sparking substantially simultaneously at two distant locations which are outside a central region of each combustion chamber and generally symetrical in plan view taken parallel to said cross section with respect to a point on the central axis of each combustion chamber.

4,091,616

CATALYTIC DEVICES FOR TREATING EXHAUST GASES OF INTERNAL COMBUSTION ENGINES

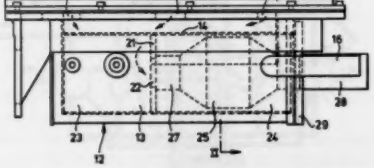
Heribert Loweg, Werne, Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Germany

Filed Feb. 26, 1976, Ser. No. 661,631

Claims priority, application Germany, Mar. 4, 1975, 2509210

Int. Cl.² F01N *3/15*

U.S. Cl. 60—295 **4 Claims**



1. A catalytic device for treating exhaust gases; said device comprising a chamber through which the exhaust gases are passed; a replaceable cartridge having projections at both ends constituting a catalyst and arranged in said chamber; means locating said cartridge in the chamber for detachment and to create an annular air gap surrounding the cartridge and forming thermal insulation in respect of the interior of the chamber; a liquid cooling jacket surrounding said chamber; an antechamber separated from the catalytic chamber by a partition having an opening permitting the exhaust gases to pass from the antechamber into a catalytic chamber and a detachable end plate closure at one end of the device remote from the partition which can be detached to allow the introduction or removal of said cartridge, wherein the cartridge projection at one end engages with the opening in the partition and the cartridge projection at the other end extends through the end plate closure and serves to discharge the treated exhaust gases.

4,091,617

HYDRAULIC CONTROLLER

Charles R. Cornell, Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 11, 1977, Ser. No. 795,689

Int. Cl.² F16H *39/46*

U.S. Cl. 60—445 **17 Claims**

1. A control system for a variable displacement hydraulic device such as a pump or motor having fluid operable means for varying the displacement thereof, and a source of pressurized fluid for operating the fluid operable means, said control system comprising:

(a) a housing defining a valve bore, an inlet fluid port adapted for series fluid communication with the source of pressurized fluid, a control fluid port adapted for series fluid communication with the fluid operable means, and a

drain fluid port adapted for communication with a fluid drain, said ports being in fluid communication with said valve bore;

(b) valve means disposed in said valve bore and movable between a first position permitting fluid communication between said inlet fluid port and said control fluid port and a second position permitting fluid communication between said control fluid port and said drain fluid port;

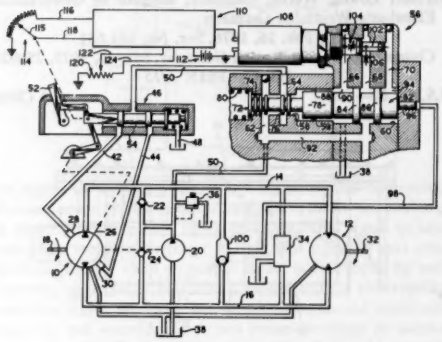
(c) first means for biasing said valve means toward said first position;

(d) second means for biasing said valve means toward said second position;

(e) one of said first and second biasing means including:

(1) means for generating a variable electrical command signal X representative of a first characteristic of said device; and

(2) means responsive to said variable electrical command signal X to provide a variable biasing force, biasing said valve means toward said respective position, said variable biasing force being related to said variable electrical command signal X in a known manner;



(f) said means for generating said variable electrical command signal X including

(1) setting command signal generator means which is variable to correspond to a desired input setting Y representative of a second characteristic of said device;

(2) means providing a setting approximation signal Y′ proportional to the product of a third characteristic Z of the device and the instantaneous variable command signal X, wherein the characteristics X, Y, and Z of the device are related by the equation:

$$X = Y/Z;$$

and

(3) means for comparing said input setting Y and said setting approximation signal Y′ and generating a new command signal X tending to minimize the difference between said input setting Y and said setting approximation signal Y′.

4,091,618

OCEAN MOTION POWER GENERATING SYSTEM

Arlyn H. Jackson, 3128 Monterey St., Oxnard, Calif. 93030

Filed Jun. 14, 1976, Ser. No. 695,612

Int. Cl.[2] E02B *9/08*

U.S. Cl. 60—497 **6 Claims**

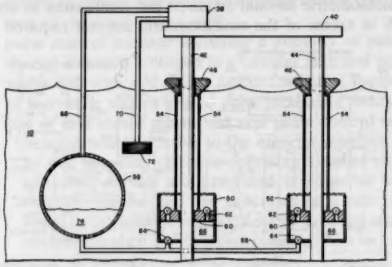
1. A power generating system for ocean platforms having a plurality of legs comprising:

means for defining a void below the surface of a body of water to create a hydrostatic head;

pumping means for removing water from said void to produce said hydrostatic head;

said pumping means comprising at least one buoy surrounding and guided by one or more legs of said platform and a cylindrical piston pump surrounding one or more legs of said platform for pumping the water from said void;

drive means for driving a power generator; and



conduit means for drawing water through said drive means into said void.

4,091,619

SERVOMOTOR

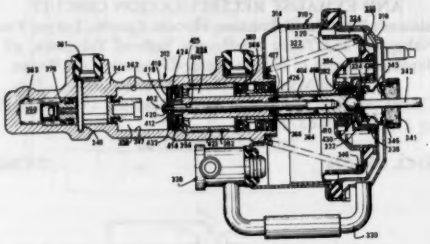
Jean-Jacques Carré, Montreuil, and Roland Muterel, Bessancourt, both of France, assignors to Societe Anonyme D.B.A., Paris, France

Filed Jun. 7, 1976, Ser. No. 693,567

Claims priority, application France, Jul. 11, 1975, 75 21876

Int. Cl.[2] B60T *13/20*

U.S. Cl. 60—553 **6 Claims**



1. A servomotor for assisting operation of a brake system comprising: a housing;

a power-assisting part in said housing having a driving piston located therein;

a part forming a hydraulic master-cylinder;

said power-assisting part cooperating with an external power source to generate a pressure difference across the driving piston;

a first valve means operated by an intake controlling element for controlling the generation of said pressure difference;

said master-cylinder part having a chamber communicating with a fluid replenishing orifice and an outlet orifice;

an assembly of two coaxial pistons including an annular piston attached to the driving piston and a central piston movable solely by way of the intake controlling element;

said first valve means when actuated out of their idle position causing the driving and annular pistons to move in unison during a first phase of servomotor operation so as to disconnect the replenishing orifice from the chamber and to generate a first pressure level in the chamber;

means for dividing said chamber into two compartments, a first of said two compartments adjoining the outlet orifice and a second of said two compartments receiving said annular piston during a second phase of servomotor operation when said central piston is moved out of its idle position for a predetermined travel to increase the pres-

sure level in the first compartment by means of a manual force exerted by the operator; and

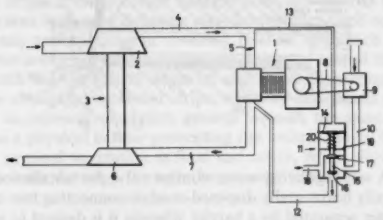
means for slowing the motion of the central piston during the first phase of servomotor operation including a rod having a first end attached to the intake controlling element, said rod being slidable in a longitudinal bore provided in said central piston and projecting into the first compartment, said means having a compression spring located between the intake controlling element and the central piston, said rod having a second end bearing a damper plate structure, said damper plate structure sweeping substantially all the effective cross-section of the first compartment during the first phase of servomotor operation.

4,091,620

SUPERCHARGED INTERNAL COMBUSTION ENGINE

Heinz Dorsch, Leonberg, Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Germany

Filed Sep. 17, 1976, Ser. No. 724,270
Claims priority, application Germany, Sep. 17, 1975, 2541371
Int. Cl.[2] F02B *37/00, 33/44*
U.S. Cl. 60—606 11 Claims



1. A supercharged internal combustion engine comprising:

an exhaust gas turbocharger means having an air charging blower means and an exhaust gas turbine means,

charging air line means interposed between said air charging blower means and the engine for supplying combustion air to the engine,

exhaust gas line means interposed between said engine and said exhaust gas turbine means for supplying exhaust gases from said engine to drive said exhaust gas turbine means,

secondary air pump means for generating a supply of secondary air,

secondary air line means interposed between said secondary air pump means and said exhaust gas line means for communicating said secondary air to said exhaust gas line means at a position upstream of said exhaust gas turbine means,

secondary air control valve means including a movable pressure responsive valve actuator, said valve means being disposed in said secondary air line means for controlling the supply of secondary air to said exhaust gas line means as a function of the position of said valve actuator,

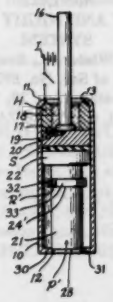
and control air line means interposed between said charging air line means and said valve means for communicating the pressure in said charging air line means to said valve actuator so as to control the position of said valve actuator directly as a function of the charging pressure in said charging air line means.

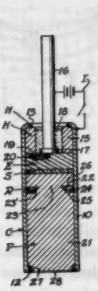
4,091,621

PYROTECHNIC PISTON ACTUATOR

Mihai D. Patrichi, Los Angeles, Calif., assignor to Networks Electronic Corp., Chatsworth, Calif.

Continuation-in-part of Ser. No. 582,839, Jun. 2, 1975, abandoned. This application Oct. 18, 1976, Ser. No. 720,364
Int. Cl.[2] F01B *29/08;* F02N *13/00*
U.S. Cl. 60—635 11 Claims





1. In a pyrotechnic piston type actuator, in combination:

a cylinder having at its rear end an inturned annular flange;

a detonating header comprising a cylindrical metal collar seated against said flange and a cylindrical eyelet of ceramic material bonded to the internal cylindrical surface of said collar;

an electrical contact rod extending through said eyelet and bonded to the inner surface thereof;

an ignition wire bridging between and secured to the inner ends of said contact rod and said collar respectively;

a piston fitted in said cylinder for axially sliding movement against a load opposed to its forward end;

an explosive charge arranged, when fired, to apply a force of expanding gases to the rear end of said piston such as to project the same against said load;

said ignition wire being in detonating association with said explosive charge;

said piston comprising forward and rear portions separated by an annular groove defined between annular shoulders at the forward end of said rear portion and at the rear end of said forward portion;

and a split ring of spring material seated in said groove, normally confined within said cylinder in a compressed condition and expandible, when released from said confinement, to a diameter such as to make abutting engagement with the forward end of said cylinder in the projected position of said piston in which said ring is released from said confinement;

said ring being engageable with said shoulder of the forward piston portion when so released and the piston is subjected to suction developed by collapse of the expanded gases resulting from the firing of said explosive charge and the

ring is pressed against said forward end of the cylinder, whereby said piston is held in said projected position against the action of said suction tending to retract it;

and a ring of solder securing the forward end of said piston to the forward end of said cylinder prior to said firing, said solder ring yielding to the explosive force of said firing so as to release the piston for said projection against the load.

4,091,622

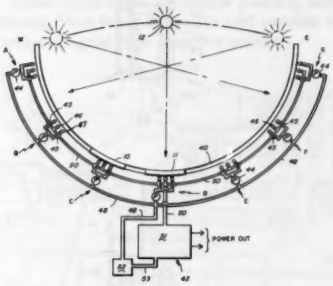
COMBINED DAY AND NIGHT SOLAR ENERGY SYSTEM

Carlo M. Marchesi, 31 Winter St., Saugus, Mass. 01906

Continuation-in-part of Ser. No. 597,820, Jul. 21, 1975, abandoned. This application Nov. 29, 1976, Ser. No. 745,830

Int. Cl.² F03G 7/02

U.S. Cl. 60—641 **8 Claims**



1. An energy conversion system, comprising, in combination:

(a) first and second collector means for collecting radiation from a source of radiation, each of the first and second collector means including a pipe arrangement containing a fluid to be heated;

(b) support means for selectively moving the first and second collector means along a predetermined path of movement;

(c) power generating means for converting into useful energy the thermal power collected by the first and second collector means; and

(d) station means disposed along the predetermined path of movement for selectively coupling the pipe arrangement of each of the first and second collector means to the power generating means.

4,091,623

GEOTHERMAL ACTUATED METHOD OF PRODUCING FRESH WATER AND ELECTRIC POWER

Jerry M. Edmondson, 1526 Delta, Apt. C, San Gabriel, Calif. 91776, and Mark H. Smoot, 6995 Atlantic Pl., Long Beach, Calif. 90805

Filed Oct. 14, 1976, Ser. No. 732,317

Int. Cl.² F03G 7/04

U.S. Cl. 60—641 **22 Claims**

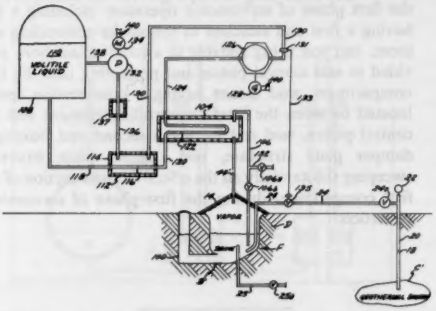
1. A method of using hot pressurized fluid from a geothermal source to transform saline water from a natural body thereof into potable, substantially mineral free water, said pressurized fluid being at a temperature of at least 212° F., said method comprising the steps of:

a. discharging a stream of said hot pressurized fluid into a first confined space;

b. discharging a stream of said saline water into said first confined space to mix with said pressurized fluid therein to provide a heated mixture of said saline water and pressurized fluid from which steam is emitted;

c. withdrawing said steam from said first confined space;

d. cooling said steam to transform said steam into said substantantially mineral free, potable water; and



e. directing said substantially mineral free potable water to a desired location.

4,091,624

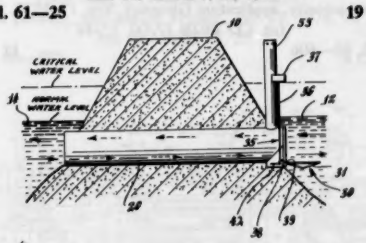
SELF-REGULATING FLUID CONTROL VALVE

Thomas J. Steinke, 494 Villa Ave., Fairfield, Conn. 06430

Filed Aug. 26, 1976, Ser. No. 717,337

Int. Cl.² E02B 7/40, 7/52

U.S. Cl. 61—25 **19 Claims**



1. A self-regulating water control valve for installation on a generally horizontally disposed conduit connecting two bodies of water separated by a barrier wherein it is desired to permit reciprocal flow of water through the conduit connecting the two bodies of water while the water level in a protected one of the bodies remains below a given critical water level and to prohibit flow of water from the other body of water through the conduit to the protected body of water when the continued flow of water would elevate the water level in the protected body of water above the critical water level, the self-regulating water control valve comprising:

A. a self-closing door hingedly mounted to the conduit connecting the two bodies of water about a pivot axis and pivotable between an open position permitting reciprocal flow of water through the conduit and a closed position blocking flow of water to the protected body of water from the other body of water;

B. means releaseably holding the door in its open position upon its being pivoted to its open position; and

C. a float connected to the means releaseably holding the door in its open position and releasing said means upon being lifted, the float positioned to be lifted and to release said means when continued flow of water would elevate the water level in the protected body of water above the critical water level,

whereby when the float releases the means releaseably holding the door in its open position, the door pivots to its closed position blocking further flow of water through the conduit to the protected body of water, and when the water level in the other body of water recedes below the water level in the protected body of water, the door is pivoted to its open position by the hydraulic head extant

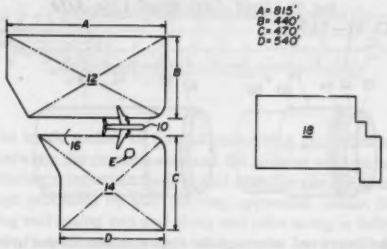
between the protected body of water and other body of water and by the flow of water through the conduit which occurs as the door opens.

4,091,625

METHOD OF INHIBITING BIRD-NESTING AT AN AIRPORT

Emilio Fontana; Rocco Fontana, both c/o 28 Skillman St., Roslyn, N.Y. 11576, and Walter Schiffelholz, 292 Willets Path, Smithtown, N.Y. 11787

Filed Jan. 10, 1977, Ser. No. 757,968
Int. Cl.[2] E02D *3/00*; A01G *13/00*
U.S. Cl. 61—35 **3 Claims**



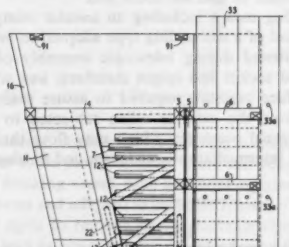
1. A method for inhibiting bird-nesting at an airport which otherwise has a natural bird-nesting area of a comparatively large extent thereat, said method comprising the steps of clearing said natural bird-nesting area of vegetation, arranging porous strips in criss-crossed relation over said cleared bird-nesting area to thereby delineate same into smaller-sized operative areas, and applying in covering relation over each said operative area a porous fabric-like panel sized to extend thereover with the peripheral edges of said panel in overlapped relation to said criss-crossed strips, whereby said panels contribute to minimal vegetation growth beneath the same and serve as a physical barrier preventing the natural use by birds of said nominal vegetation as food and cover, while allowing natural water drainage through the porosity thereof.

4,091,626

TRENCH SHORING MACHINES

Alistair Nigel Thompson, 20 Farfield Avenue, Knaresborough, Yorkshire, England

Filed Dec. 20, 1976, Ser. No. 752,613
Claims priority, application United Kingdom, Dec. 24, 1975, 52822/75
Int. Cl.[2] E21D *5/12*
U.S. Cl. 61—41 A **12 Claims**



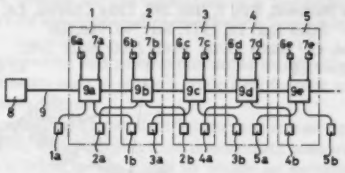
1. A trench shoring machine comprising a front framework, a rear framework, a first drive means acting between the two frameworks for causing longitudinal advance of each framework relative to the other, a series of longitudinally extending vertically spaced piles arranged along each side of the frameworks, guide means guiding the piles for substantially horizontal sliding movement longitudinally of the frameworks, second drive means for advancing the piles longitudinally relative to the frameworks, means for locking the piles to each framework to prevent movement of the piles relative to that framework, and rearward extensions of the piles, said rearward extensions being laterally spaced from side elements at the respective sides of the rear framework to delineate spaces for receiving lining members to shore the trench sides after advance of the piles.

4,091,627

SYSTEM AND EQUIPMENT FOR OPERATING SELF-ADVANCING SUPPORTS

Ken Takahashi, and Hideo Inoue, both of Tokyo, Japan, assignors to Taiheiyo Engineering Inc., Tokyo, Japan

Filed Dec. 15, 1976, Ser. No. 750,782
Claims priority, application Japan, Aug. 14, 1976, 51/96730
Int. Cl.[2] E21C *35/24*; F01B *25/26*
U.S. Cl. 61—45 D **12 Claims**



1. Apparatus for operating self-advancing mine roof supporting systems which includes a plurality of support plate means each operated by hydraulic cylinder means for vertically moving and advancing the support plate means, the combination comprising a plurality of electromagnetic valves controlling the operation of said hydraulic cylinder means, interconnecting means interconnecting said hydraulic cylinder means and said electromagnetic valves such that the latter are remotely located relative to said hydraulic cylinder means to thereby provide for remote operation of said hydraulic cylinder means by said electromagnetic valves, said electromagnetic valves comprising key-operated operating devices operable by one or more manually manipulated operating keys, said key-operated operating devices having a plurality of key-receiving means of different geometrical configuration such that each key-receiving means is operable by an operating key of the same geometrical configuration.

4,091,628

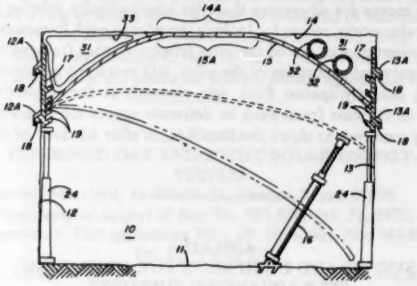
PRESTRESSED ELASTIC ARCHED MINE ROOF SUPPORT

Jay Hilary Kelley, 3292 University Ave., Morgantown, W. Va. 26505

Continuation-in-part of Ser. No. 727,024, Sep. 27, 1976, abandoned. This application Feb. 25, 1977, Ser. No. 772,015
Int. Cl.[2] E21D *19/00*
U.S. Cl. 61—45 C **14 Claims**

1. A support for a surface of a mine opening, said support comprising a elongated plate member having a preselected downwardly-concave curvature along the length thereof and a sufficient tensile strength to withstand elastic flattening of the middle portion of the plate member from said preselected curvature into prestressed contact against the surface of the mine opening, and prestressing emplacement means including bolt members anchored in the mine strata to engage said plate

member at distally-spaced points from the middle portion of said plate member to elastically flatten said plate member by



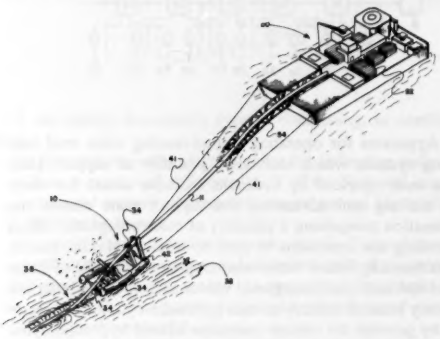
compressively stressing a face surface thereof against the surface of said mine opening.

4,091,629

MARINE PIPELINE INSTALLATION SYSTEM

Charles R. Gunn, 312 Saturn Rd., Bayou Vista, La. 70380, and Rayburn Bushnell, Rte. 7, Box 295, Lake Charles, La. 70601

Filed Apr. 11, 1977, Ser. No. 786,500
Int. Cl.[2] B23B *35/04;* F16L *1/00;* E02F *5/02*
U.S. Cl. 61—72.4 **27 Claims**



1. A submarine pipeline installation apparatus for forming a ditch and for laying a generally rigid pipeline in the formed ditch from a surface vessel in a marine environment in a combined operation comprising:

a. a supportive, rigid frame adapted to travel on the water bottom;

b. ditch forming means attached to said frame on its lower side for forming the ditch for the generally rigid pipeline in the water bottom;

c. a series of aligned, supportive surface means for providing substantially all the structural support to the pipeline after the pipeline leaves the surface vessel but before the pipeline enters the ditch, said supportive surface means rigidly mounted on and carried by said frame on its upper side substantially above the operative portions of said ditch forming means, each successive one of said series being lower than or substantially equal to the height of the supporting surface of the preceding one of said supportive surface means, said supportive surface means being capable of movably and supportively receiving the generally rigid pipeline thereon and placing the generally rigid pipeline down in a continuously downward manner on the water bottom in the ditch substantially behind the operative portions of said ditch forming means; and

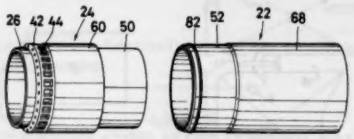
d. towing means on said frame for connecting said frame to the surface vessel laying the pipeline for towing said frame with the vessel as it moves forward, the ditch being formed by said ditch forming means as said frame is towed forward by the surface vessel and the pipeline being simultaneously laid in the ditch from said supportive surfaces behind said ditch forming means, the ditching and laying operations for the pipeline being combined into one continuous operation without the operative portions of said ditching means having to straddle the pipeline.

4,091,630

INTERMEDIATE SLEEVE FOR INSTALLING PIPELINE BY PROPELLING PIPES UNDERGROUND

Yukiyasu Nemoto, Ibaraki, and Kyosuke Nanba, Kawanishi, both of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed May 3, 1977, Ser. No. 793,361
Int. Cl.[2] F16L *1/00;* E01G *3/04, 5/14*
U.S. Cl. 61—72.7 **8 Claims**



1. An improved intermediate sleeve means for use in installing and becoming an integral part of an underground pipeline unable to be installed via conventional excavating of an open ditch, but which pipeline is installed by propelling in a known manner successive sections of pipe forming a pipeline assembly through a sub-terrainean medium with the aid of expansible-contractible jack means in an initial starting pit, and with the aid of an intermediate sleeve means together with associated intermediate expansible-contractible jack means collectively interposed between collective pluralities of interjoined pipeline sections, with said intermediate sleeve means thus becoming integrally incorporated in one or more intermediate portions of the completed pipeline assembly; said improved intermediate sleeve means comprising the combination of:

(a) an annular sleeve-like socket member constituting an outer pipe member;

(b) an annular sleeve-like spigot member constituting an inner pipe member;

(c) said inner and outer pipe members including, respectively, complementally formed annular sleeve portions adapted for telescopic relative movement;

(d) annular sealing means interposed between radially adjacent movable portions of said spigot and socket members at an area generally intermediate opposite ends thereof for effectively sealing off predetermined portions of said spigot and socket members while permitting relative sliding movement of said members; and

(e) said sealing means including an annular compressively resilient seal of a self-sealing type adapted to be progressively flattened during telescopic assembly of and between said socket and spigot members, and which provides surface pressure required to assure sealing of the interior from the exterior when subjected to predetermined internal pressures which may flow through said improved intermediate sleeve means and finished pipeline assembly.

4,091,631

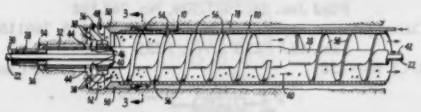
SYSTEM AND METHOD FOR INSTALLING PRODUCTION CASINGS

Martin Dee Cherrington, Carmichael, Calif., assignor to Titan Contractors Corporation, Sacramento, Calif.

Continuation-in-part of Ser. No. 595,830, Jul. 14, 1975, Pat. No. 4,043,136. This application Aug. 26, 1976, Ser. No. 717,827
Int. Cl.[2] F16L *1/02*
U.S. Cl. 61—72.7 **3 Claims**

1. Apparatus for emplacing a casing underground beneath an

obstacle and between first and second ground level locations, said apparatus comprising means for placing a pilot string along an invert arcuate path beneath said obstacle between said ground level locations; a reaming apparatus for reaming an annulus about said pilot string to a preselected diameter; means for introducing a casing behind said reaming apparatus, the diameter of said casing being less than the reamed diameter, thereby to establish an annular void in the ground between the outer circumference of said casing and the inner circumference of the circumscribing ground; means for providing a substantially sealing contact between the outer surface of said casing



and the inside surface of the circumscribing ground at a location between the reaming side and the annular void; means for introducing a transport fluid at said reaming site for entrained cuttings produced by said reaming apparatus; means for advancing said casing into and along said pilot string in following relation to said reaming apparatus; means for impelling said transport fluid and entrained cuttings into the interior of the leading portion of said casing; and positive displacement pump means located within the casing at the leading end thereof for evacuating the transport fluid and entrained cuttings from said reaming site in sealed-off relation to said annular void.

4,091,632

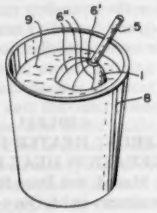
BEVERAGE COOLING DEVICE HAVING CONSUMABLE FOODSTUFF THEREIN

Richard B. Marchewka, and Laima Marchewka, both of 3200 S. Racine, Chicago, Ill. 60606

Filed Jan. 27, 1976, Ser. No. 652,821

Int. Cl.² F25C *1/00*

U.S. Cl. 62—1 **9 Claims**



1. A beverage cooling device having a compact size and shape so as to be easily inserted into, and received into, an individual drinking vessel, such as a drinking glass, for cooling a liquid therein and adapted to either be reused, if desired, or to be broken open to remove edible contents therein and then discarded, said device comprising a closed, semi-flexible plastic container and a consumable flavored liquid situated within said container and capable of being frozen while so situated within said container, said container having a selected three dimensional shape, sealable entrance means for facilitating filling of said container with said liquid and permitting sealing of said container after it is filled with said liquid, and container opening means for opening said container to facilitate removal of said liquid in a unitary frozen solid state from said container.

4,091,633

PROCESS AND APPARATUS FOR THE SEPARATION OF A LOW-BOILING GASEOUS MIXTURE

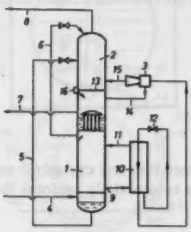
Gerhard Linde, Munich, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Aug. 6, 1976, Ser. No. 712,264

Claims priority, application Germany, Aug. 8, 1975, 2535489

Int. Cl.² F25J *3/04*

U.S. Cl. 62—29 **11 Claims**



1. A process for the separation of a low-boiling gaseous mixture by low-temperature rectification, comprising the steps of:

(a) subjecting said gaseous mixture to rectification in a high pressure zone to obtain a crude light fraction and a crude heavy fraction;

(b) passing said crude light fraction and at least a part of said crude heavy fraction to an intermediate pressure rectification zone having plates to obtain an enriched gaseous overhead and an enriched liquid bottoms, said at least a part of said crude heavy fraction being passed to said intermediate pressure rectification zone via an ejector wherein said at least a part of said crude heavy fraction acts as driving means therefor;

(c) passing said enriched liquid bottoms into a low-pressure rectification zone having plates; and

(d) withdrawing vapor from said low pressure rectification zone by suction through said ejector, increasing the pressure of said vapor in said ejector and passing resultant vapor into the intermediate pressure rectification zone, whereby the pressure in the high pressure column is lower than the pressure in a high pressure column of a double column employing only one pressure zone in the low pressure column.

4,091,634

CRYOGENIC DEVICE WITH HEAT INPUT MEANS

Maurice William Shepherd, Quaint Ways, Bishopstone, Salisbury, England

Filed Jul. 27, 1976, Ser. No. 708,982

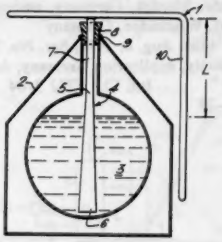
Claims priority, application United Kingdom, Jul. 30, 1975, 31817/75

Int. Cl.² F17C *7/02*

U.S. Cl. 62—45 **10 Claims**

1. A cryogenic apparatus comprising a heat-insulated container defining a space for housing cryogenic matter, a heat-conducting member of elongated form disposed within the container, said elongated member having a heat-input end and a heat-output end, and heat conducting means for conducting heat from the ambient atmosphere to the heat-input end of the elongated member, said elongated member having a lateral

cross-section which increases from the heat-input end of the member towards the heat-output end thereof, whereby ambient heat is introduced into any cryogenic matter present in the container, and at a substantially uniform rate.

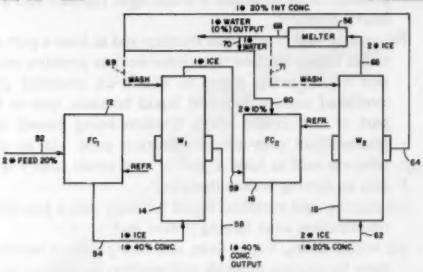


4,091,635

APPARATUS FOR CONCENTRATING A FEED STREAM

Abraham Ogman, Peabody, Mass., assignor to Avco Corporation, Wilmington, Mass.

Filed Aug. 18, 1976, Ser. No. 715,423
Int. Cl.[2] B01D *9/04*; C02B *1/12*
U.S. Cl. 62—123 **4 Claims**



1. A freeze-crystallization apparatus for concentrating a feed stream, comprising, in combination:

a first stage including:

first freezer-crystallizer means for treating the feed stream to produce a slurry of ice and highly concentrated output;

means for introducing the feed stream into said first freezer-crystallizer means without prior dilution;

first wash column means for washing and separating ice produced in said first freezer-crystallizer means from highly concentrated output, said first wash column means including means for introducing concentrated wash water therein;

means for introducing slurry from the first freezer-crystallizer means into said first wash column means;

means for harvesting ice from said first wash column means; and,

means for withdrawing highly concentrated output from said first wash column means;

a second stage including:

second freezer-crystallizer means for treating diluted concentrate to produce ice and an intermediate concentrate;

means for introducing diluted concentrate into said second freezer-crystallizer means;

second wash column means for washing and separating ice produced in said second freezer-crystallizer means from intermediate concentrate, said second wash column means including means for introducing wash water therein;

means for harvesting ice from said second wash column means; and,

means for withdrawing intermediate concentrate from said second wash column; and,

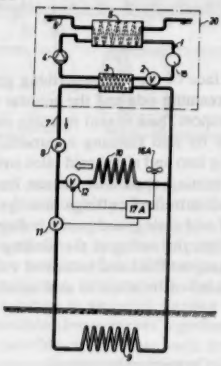
means for diluting said withdrawn intermediate concentrate to form diluted concentrate for introduction into said second freezer-crystallizer means.

4,091,636

HEAT PUMP SYSTEM

Peter Heinrich Erwin Margen, Nykoping, Sweden, assignor to Aktiebolaget Atomenergi, Stockholm, Sweden

Filed Jan. 24, 1977, Ser. No. 762,194
Claims priority, application Sweden, Feb. 3, 1976, 7601150
Int. Cl.[2] F25B *27/02*; F25D *23/12*
U.S. Cl. 62—238 **15 Claims**



1. In a heat pump system comprising a refrigerant circuit (1) comprising in series an expansion valve, a first vaporizer, a compressor and a condenser which condenser is arranged to transfer condensation heat of the refrigerant medium to a medium such as radiator water, said vaporizer being arranged in heat exchange relationship with a secondary circuit which is filled with a liquid having low freezing temperature and which comprises a circulation pump (8) for the liquid, at least one earth heat absorber being included in the secondary circuit, the improvement that an air heat absorber which is situated outdoors is arranged in the secondary circuit in parallel with the earth heat absorber, and that valve means are arranged for the heat absorbers for control of the flow distribution between them.

4,091,637

ELECTRIC DEFROST HEATER FOR FIN AND TUBE REFRIGERATION HEAT EXCHANGER

Kenneth E. Vogel, Mound, and Dean R. Peterson, Minnetonka, both of Minn., assignors to McQuay-Perfex, Inc., Minneapolis, Minn.

Filed Oct. 13, 1976, Ser. No. 731,896
Int. Cl.[2] F25D *21/08*; H05B *3/00*
U.S. Cl. 62—276 **5 Claims**

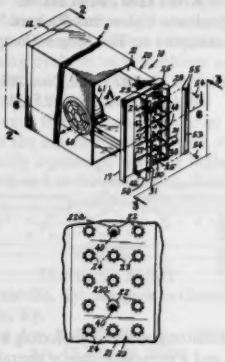
1. In a heat exchanger:

an assembly of spaced parallel heat exchanger fins having sets of circular, collared, coaxially aligned apertures, the collars of and the spacings between said fins being such that the apertures of any set coact axially to jointly define an essentially continuous tube;

a refrigerant tube transversing the essentially continuous tube defined by one set of said apertures and sized for engagement by said collars of said apertures in intimate heat conductive relation;

and an axially replaceable heating element traversing the essentially continuous tube defined by another set of said

apertures and sized to fit loosely therein instead of a refrigerant tube, so that heat from said element is transmitted to



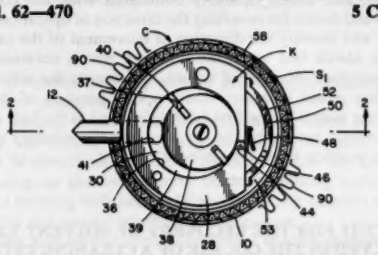
said fins both by radiation and by conduction, and so that axial relative movement between said element and said fins is enabled.

4,091,638

COOLING SYSTEM FOR HERMETIC COMPRESSOR

George Charles Mitch, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 13, 1976, Ser. No. 750,082
Int. Cl.[2] F25B *43/02*; F04B *17/00, 35/00*; F01C *21/04*
U.S. Cl. 62—470 5 Claims



1. A rotary hermetic refrigerant compressor comprising: a rotary, sliding vane refrigerant compressing unit having an inlet and an outlet; a motor operatively connected to drive said compressing unit; a hermetic shell enclosing said compressing unit and said motor; means defining a lubricant sump in the lower portion of said shell; means defining an annular lubricant-refrigerant separator chamber adjacent the outlet of said refrigerant compressing unit, the outer boundary of said chamber being defined by a portion of the inside wall of said shell such that separated lubricant is directed into contact with said inside wall and flows downwardly thereover to said lubricant sump, so that heat is abstracted from said lubricant through said shell wall and rejected to the outside of said shell; and means for directing lubricant from said sump to said motor and compressing unit for lubricating and cooling purposes.

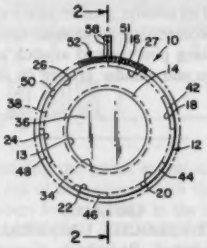
4,091,639

FRAME APPARATUS

Karl Benda, 224-74 Horace Harding Blvd., Bayside, N.Y. 11364

Filed Nov. 2, 1976, Ser. No. 738,135
Int. Cl.[2] A44C *15/00*
U.S. Cl. 63—18 4 Claims

1. A frame for encircling an article having a continuous edge comprising a first frame section having an outer face and an inner face, said first frame section extending around a first opening and having a first inner edge around said first opening, said first inner edge having a first flange means thereon projecting toward the center of said first opening, said first frame section having a first outer edge with indentation means therein, a second frame section having an outer face and an inner face, said second frame section extending around a second opening and having a second inner edge around said second opening, said second inner edge having a second flange means thereon projecting toward the center of said second opening, said second frame section having a second outer edge, the edges of said first opening and said second opening being substantially the same, a plurality of boss means extending from said second outer edge, resilient tying means for securing



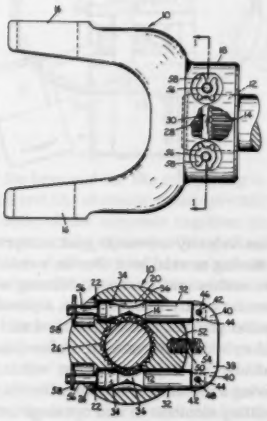
said first frame section to said second frame section so that when said first frame section and said second frame section are joined with the inner faces of each abutting one another said first flange means and said second flange means define a groove between them extending substantially towards the center of said first and second openings, said boss means are arranged to be received by said indentation means and said tying means is arranged to extend around the periphery of said first outer edge and said second outer edge so that a biasing force is applied from said periphery toward the centers of said first and second openings.

4,091,640

POWER DRIVE YOKE

Stanley Olkowski, Jr., Detroit, and John Christee McElwain, Rochester, both of Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Aug. 19, 1976, Ser. No. 715,939
Int. Cl.[2] F16D *3/06*
U.S. Cl. 64—4 10 Claims



1. A power drive yoke adapted for quick attachment to and disconnection from an output drive shaft of a power drive means comprising a yoke having a hub formed thereon, said hub having a centrally disposed longitudinally extending bore for accepting a portion of said output drive shaft, said output

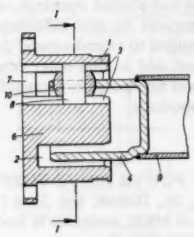
drive shaft mechanically interconnected to said yoke to rotationally drive said yoke by fastening means, an annular groove provided on the portion of said output shaft accepted within said bore in said hub, said hub being provided with at least two generally parallel bores each tangentially intersecting said bore on opposite sides thereof, a locking pin slidably disposed in each of said parallel bores, said locking pin having a locking surface thereon to engage said annular groove on said output shaft, connecting means connecting each of said locking pins to substantially simultaneously, slidably move said locking pins within said bores into engagement and disengagement with said output shaft at its annular groove, said locking surfaces on said locking pins comprising an annular tapered surface disposed on said locking pins tapered at such an angle so as to tangentially engage said annular groove on said output shaft.

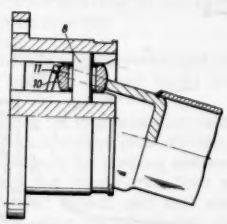
4,091,641

CONSTANT VELOCITY UNIVERSAL JOINT

Hans-Heinrich Welschof, Rodenbach, Germany, assignor to Uni-Cardan AG, Lohmar, Rheinland, Germany

Filed Apr. 15, 1976, Ser. No. 677,127
Claims priority, application Germany, Apr. 23, 1975, 2517967
Int. Cl.[2] F16D *3/30*
U.S. Cl. 64—21 **7 Claims**





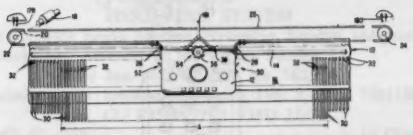
1. A constant velocity universal joint comprising an outer joint element having an axial bore therein, a central axial cylindrical member within said bore and defining with said joint element an annular cavity therebetween, a plurality of axially extending parallel grooves in the surface of said bore and the surface of said cylindrical member to define pairs of opposed grooves, a tubular inner joint element within said annular cavity and having a plurality of openings therein, a plurality of torque transmitting elements in said openings and each torque transmitting element being in a pair of opposed grooves, said torque transmitting elements each having a spherical portion guiding said element within a said opening, said torque transmitting elements further each having cylindrical portions positioned in said grooves to roll therein upon bending of the joint during rotation.

4,091,642

CARRIAGE REVERSING CONTROL FOR A FLAT BED KNITTING MACHINE

John Anthony Raudonis, Union, and Richard Mead, Whippany, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Apr. 19, 1977, Ser. No. 788,857
Int. Cl.[2] D04B *7/10, 15/36*
U.S. Cl. 66—76 **6 Claims**



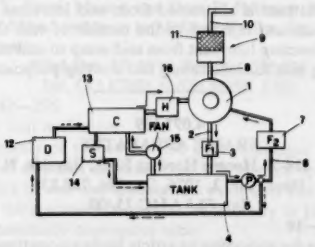
1. In a flat bed knitting machine including a carriage slidable on a needle bed and a reversible motor operably connected to the carriage for moving the carriage on the bed, the combination comprising pulse generating means operable to produce a pulse for each needle position as the carriage is moved on the bed, needle butt detecting means operable by needles in working positions as the carriage is moved on the bed, counting means operably connected with the pulse generating means and butt detecting means, said counting means being incremented by pulses from the pulse generating means and reset by pulses from the butt detecting means whereby the counting means is caused to accumulate counts only when the butt detecting means is moved by the carriage beyond the working needles, and means operably connected with the counting means and motor for reversing the direction of operation of the motor and thereby the direction of movement of the carriage on the needle bed when the counting means accumulates a predetermined number of counts, and means for setting the counting means to a zero count upon operation of the butt detecting means by the first needle detected as the butt detecting means is moved by the carriage into the working needles from a position beyond such needles.

4,091,643

CIRCUIT FOR THE RECOVERY OF SOLVENT VAPOR EVOLVED IN THE COURSE OF A CLEANING CYCLE IN DRY-CLEANING MACHINES OR PLANTS, AND FOR THE DE-PRESSURIZING OF SUCH MACHINES

Guido Zucchini, Castelmaggiore (Bologna), Italy, assignor to AMA Universal S.p.A., Bologna, Italy

Filed Feb. 17, 1977, Ser. No. 769,849
Claims priority, application Italy, May 14, 1976, 3429 A/76; Nov. 2, 1976, 3575 A/76
Int. Cl.[2] D06F *43/08*
U.S. Cl. 68—18 C **5 Claims**



1. In dry-cleaning machines and/or plants including a cleaning circuit comprising a cleaning drum, a solvent tank, a solvent circulating pump and a filter for the solvent, all connected in series, and a drying and solvent recovery circuit comprising

said drum, a circulating fan and a condenser connected in series, the vapor outlet of said condenser being connected through a heater to said drum and the liquid outlet of said condenser being connected through a separator to said tank, the improvement whereby solvent vapors evolved in the course of a cleaning cycle in such machines and/or plants are recovered and such machines and/or plants are depressurized, consisting essentially of:

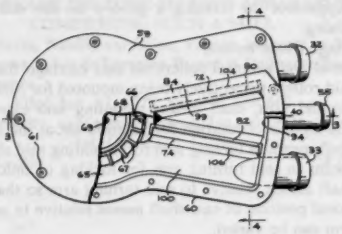
a solvent recovery filter, located at a level higher than the remainder of the machine and/or plant, said filter having an inlet directly connected with the highest point of said drying circuit, and an outlet leading directly to the atmosphere.

4,091,644

TURBINE PUMP

John Bochan, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Apr. 8, 1977, Ser. No. 785,936
Int. Cl.² D06F *29/00*
U.S. Cl. 68—18 F **16 Claims**



1. A reversible turbine pump for producing a bi-directional liquid flow comprising:

(a) a housing having a substantially annular outer wall and top and bottom walls closing the ends of the outer wall;

(b) a bi-directional rotatable impeller within the housing having an annular series of blades extending outwardly and forming with said walls a substantially toroidal space;

(c) first and second spaced outlet openings;

(d) first and second circumferentially spaced channels between the impeller and each of the outlet openings in liquid flow communication with the toroidal space;

(e) a dam between said channels; and

(f) an inlet opening located in each of said channels, each of said inlet openings having a flapper check valve arranged to open and permit liquid flow through the inlet opening in one direction of rotation of the impeller and close to prevent the flow of liquid through the opening in the opposite direction of rotation of the impeller, one of said flapper check valves being open when the other is closed during impeller rotation, said inlet openings being dimensioned to flow liquid therethrough in a volume greater than the capacity of the impeller to move the liquid through the toroidal space; and

(g) a liquid reservoir arranged to supply liquid to the inlet openings at least equal to the inlet opening liquid flow through volume.

4,091,645

CONTINUOUS LAUNDERING APPARATUS

Paul H. Gallagher, 105 West Adams St., Evanston, Ill. 60603

Filed Oct. 4, 1976, Ser. No. 729,384
Int. Cl.² D06F *35/00*
U.S. Cl. 68—158 **11 Claims**

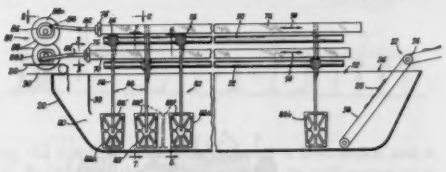
1. Laundry apparatus comprising

a tank for containing wash water, and having an inlet end and an outlet end,

a plurality of operating members movable longitudinally of the tank and engageable with goods in the tank, and operable for agitating the goods in response to engaging them,

the members also being operable for positively and bodily moving the goods engaged thereby longitudinally of the tank an extent equal to the full movement of the members in that direction, and

means operable for so moving the members longitudinally in groups, those of one group into engagement with the



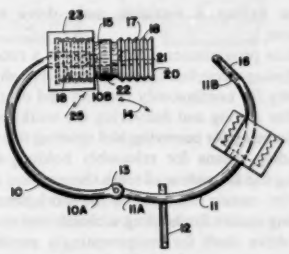
goods and moving the goods as stated, and those in another group out of engagement with the goods and moving the members longitudinally in the opposite direction, and for successively and continually so moving the members in the respective groups, whereby at substantially all times the members of one group engage and move the goods, and thereby the members of both groups together are operative in their repeated action for moving the goods continually through the tank.

4,091,646

HOLDER FOR KEYS AND THE LIKE

George Sugimoto, 1195 Dominion St., Winnipeg, Canada (R3E 2P6)

Filed Jun. 27, 1977, Ser. No. 810,487
Int. Cl.² A44B *15/00*
U.S. Cl. 70—456 R **16 Claims**



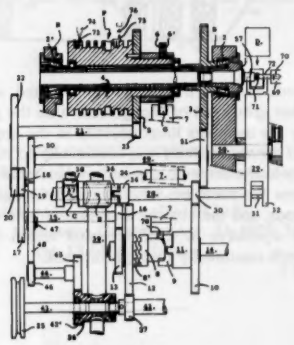
1. A holder for keys and the like comprising in combination a pair of curved rod-like elements, means pivotally connecting adjacent one ends of the elements together and detachable locking means connecting adjacent other ends of the elements together, said detachable locking means including a substantially cylindrical member, means securing same to the end of one of said elements, and means detachably securing same to the end of the other of said elements, said last mentioned means including a slot formed in said member and extending from the end of said member adjacent said end of said other element along one side of said member, to a point spaced from said end of said member, the outer wall of said member through which said slot is formed, being screw threaded, an fastening means freely engaging said other element and screw threadably engaging said screw threaded outer wall of said member, and means on said other element restraining displacement of said other element from said member when said fastening means is screw threadably engageable with said member as aforesaid.

4,091,647

MACHINE FOR CHISEL FORMING THE TEETH ON PARTS OF REVOLUTION, AND IN PARTICULAR WHEELS OF CIGARETTE LIGHTERS OR THE LIKE

Michel Martin, 44, Av. Jacques Arnaud, Cluses, France (F-74300)

Filed Mar. 18, 1977, Ser. No. 779,029
Claims priority, application France, Mar. 22, 1976, 76 08276
Int. Cl.[2] B21D *31/02*
U.S. Cl. 72—72 9 Claims



1. A machine for chisel forming teeth on the periphery of workpieces such as rotatable parts of the type, for example, of wheels for cigarette lighters and the like, said machine comprising:

a frame having a rotatable main drive shaft mounted thereon;

a machine programmer which includes a rotatable drum;

a first linkage coupled to said main drive shaft and driven thereby for continuously rotating said drum;

means for storing and delivering the workpieces;

a spindle being for receiving and rotating the workpiece and including means for releasably holding the workpiece during the formation of teeth therein;

means for cutting the teeth in the workpiece comprising a holding means for holding a chisel, and means driven by said drive shaft for reciprocatingly moving said chisel holding means, said chisel being held and driven such that upon the striking of each tooth, said chisel describes an imposed, driven path which results in the chisel forcefully penetrating, under pressure, into the workpiece, and in the formation of the hollow of the tooth by the working up of the material of the workpiece; and

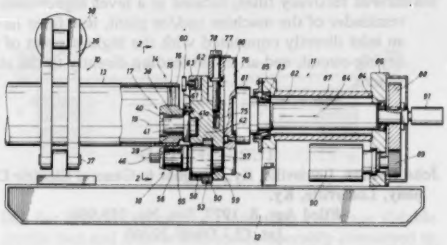
means for rotating said spindle and the workpiece held therein for a first time period necessary to rotate the workpiece from one to the next position for striking, then for a second time period for at least reducing the speed of rotation of said spindle and hence of the workpiece, during which the tooth is struck, then for a third time period for accelerating the speed of rotation of said spindle to compensate for the amount of rotation lost during said second time period, and then repeating said steps until all of the teeth have been cut, said spindle rotating means including a second linkage coupled to said main drive shaft and driven thereby independently of said first linkage.

4,091,648

PIPE GROOVING SYSTEMS

Joe C. McCaslin, Houston, Tex., assignor to Zap-Lok Systems International, Houston, Tex.

Filed Apr. 6, 1977, Ser. No. 785,231
Int. Cl.[2] B21D *19/04*
U.S. Cl. 72—121 2 Claims



1. Apparatus for forming a groove on the end of a pipe comprising:

carriage frame means;

internal and external rollers on said carriage frame means, said rollers respectively being mounted for rotation about parallel axes, shaft means mounting said external roller and its axis of rotation for rotation about the axis of said shaft means, a turning arm for mounting said shaft means, means in said turning arm for locking or unlocking said shaft means relative to said turning arm so that the rotational position of said shaft means relative to said turning arm can be varied;

hydraulic means coupled between said carriage frame means and said turning arm for moving said rollers toward and away from one another;

means for rotating said carriage frame means about an axis parallel to the axis of said rollers so that said rollers, as a pair, may be rotated about the axis of said carriage frame means;

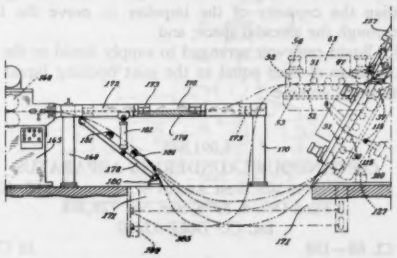
said rollers respectively having an annular groove and an annular bead aligned relative to one another for forming a groove in the wall of a pipe when said rollers are moved toward one another.

4,091,649

METHOD OF UNCOILING AND STRAIGHTENING STRIP MATERIAL

Kenneth C. Johnson, Des Plaines, Ill., assignor to F. J. Littell Machine Company, Chicago, Ill.

Division of Ser. No. 732,324, Oct. 14, 1976, Pat. No. 4,047,416.
This application Mar. 18, 1977, Ser. No. 779,162
Int. Cl.[2] B21D *1/02*
U.S. Cl. 72—183 2 Claims



1. In a method of threading and dispensing strip material which is in the form of a coil, the steps which include support-

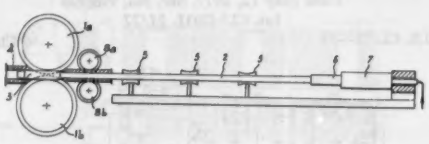
ing the coil in a raised position for rotation, unwinding the strip material from the coil and directing the same downwardly at an inclined angle with respect to the horizontal, passing the material through a pivotally supported straightening machine which for the purpose is also downwardly inclined at an angle substantially the same as the angle which the material assumes as its travels from the coil to the straightening machine, the passage of the material through the straightening machine having the effect of removing the curvature which the strip assumes while on the coil and for otherwise straightening the material, delivering the strip material as its exits from the inclined straightening machine to an accumulation pit located slightly below and relatively near the exit end, said accumulation pit producing a loop of excess material in advance of the feeding rolls of the press to which the material is being fed, and finally passing the material of said loop, as said material moves from the said pit to the feed rolls of the press, between collapsed table sections of a collapsible table located substantially over the accumulation pit.

4,091,650

ROLLING MILL FOR FORMING SEAMLESS TUBES, AND SEAMLESS TUBE-MAKING APPARATUS COMPRISING SUCH A MILL

Pierre Peytavin, Neuilly-sur-Seine, France, assignor to Vallourec (Usines a Tubes de Lorraine-Escaut et Vallourec Reunies), Paris, France

Filed Jan. 17, 1977, Ser. No. 759,660
Claims priority, application France, Jan. 19, 1976, 76 01240
Int. Cl.² B21B *17/10*
U.S. Cl. 72—209 **8 Claims**



1. A rolling mill for the manufacture of seamless tubes comprising a first pair of mill rolls and a second pair of mill rolls, the axes of rotation of the rolls of one of the pairs of rolls being contained in a plane orthogonal to that containing the axes of rotation of the other of said pairs of rolls, drive means for rotating said mill rolls, a mandrel rod, a mandrel having a cylindrical cross-section over the major portion of its length and capable of being fastened to the extremity of the mandrel rod at the region of the rolls, said mandrel being engaged in a tube blank between the rolls, drive means for displacing said mandrel relative to the rolls, during rolling, in the direction of advance of the tube blank, said mandrel having a length between about 10% and about 20% of the length of the rolled tube, and being displaced in relation to the rollers so that during a rolling operation, the mandrel moves over its entire length between the rolls of the two pairs of rolls, the distance between said pairs of rolls being at least equal to half the length of the mandrel, and said two pairs of rolls comprising the only mill rolls for rolling said blank.

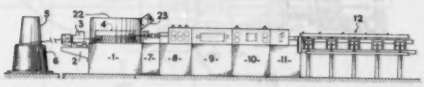
4,091,651

DRAWING, STRAIGHTENING, SECTIONING AND POLISHING MACHINE

Leon Rose, and Christian Mandras, both of Revigny-sur-Ornain, France, assignors to Societe Metallurgique de Revigny, Revigny-sur-Ornain, France

Filed Aug. 9, 1976, Ser. No. 712,574
Claims priority, application France, Aug. 8, 1975, 75 24795
Int. Cl.² B21C *1/12*
U.S. Cl. 72—289 **7 Claims**

1. A machine for continuously drawing a product comprising a draw die, a pulling device for drawing the product to be drawn through the die, the pulling device comprising a chassis, a shaft journalled in the chassis, a drum mounted on the shaft and for receiving the drawn product wound thereon, means for driving the drum in rotation, the drum having an input side for receiving the drawn product from the die and an output side from which the drawn product extends, and means for putting the drawn product extending from the output side of the drum under tension so as to cause the drum to perform the drawing action of said product through said draw die, said means for



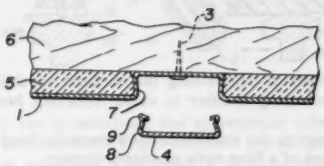
driving the drum in rotation comprising a D-C motor and a circuit for varying the current supplied to said motor as a function of the amount of tension that must be exerted on the product at the output side of the drum so that the latter performs the drawing action of said product, wherein the means for putting the product under tension at the output of the drum comprise a roller cage disposed in the path of the drawn product, driving rollers of the roller cage being rotated by a further D-C motor controlled in accordance with the force to be exerted on the drawn product at the output side of the drum.

4,091,652

APPARATUS FOR SHAPING METAL SHEETS

Clinton H. Wilcox, Romoland, Calif., assignor to Alumax, Inc., San Mateo, Calif.

Filed Jan. 28, 1977, Ser. No. 763,366
Int. Cl.² B21D *11/10*
U.S. Cl. 72—312 **3 Claims**



1. A device for forming a blank metal sheet into a desired shape comprising:

A. die means configured to be of the shape corresponding to the shape of the finally formed metal sheet;

B. a first pressure means for pressing the blank metal sheet against a die;

C. a second pressure means for applying pressure against said first pressure means;

D. crimping means pivotally attached to said second pressure means for conforming said blank metal sheet into its predetermined shape around said die means; and

E. a third pressure means for actuating said crimping means after said first and second pressure means have secured said blank metal sheet to said die.

4,091,653

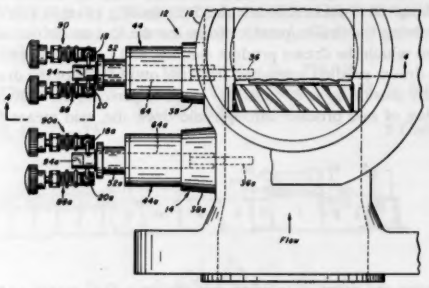
TURBINE METER IN-LINE CHECKING APPARATUS AND METHOD

Winston F. Z. Lee, Delmont, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed May 18, 1977, Ser. No. 798,147
Int. Cl.² G01F *25/00*
U.S. Cl. 73—3 **16 Claims**

1. In combination, a turbine meter having a rotary turbine

wheel comprised of spaced turbine blades, sensing means responsive to the direction of fluid flow leaving said blades for



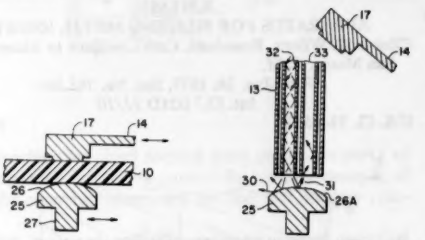
measuring the deflection, or exit, angle of said flow, and signal means for utilizing said exit angle.

4,091,654

MAGNETIC RECORDING MEMBER ABRASION TESTER

Roy E. Hurtig, Saratoga, and Stanley I. Rojo, San Jose, both of Calif., assignors to Memorex Corporation, Santa Clara, Calif.

Filed Apr. 18, 1977, Ser. No. 788,462
Int. Cl.[2] G01N *3/56*
U.S. Cl. 73—7 **18 Claims**



1. A method of determining the abrasion capability of a magnetic recording member to cause recording head wear comprising:

A. determining the smoothness of a magnetic head surface by means of a fiber optic emitter-collector;

B. contacting the surface of said magnetic head to a moving magnetic recording member at a predetermined constant pressure;

C. maintaining said contact for a predetermined period of time;

D. removing the magnetic head from the moving magnetic recording member; and

E. determining the relative smoothness of the magnetic head surface by means of a fiber optic emitter-collector.

4,091,655

METHOD AND APPARATUS FOR ANALYZING TRACE COMPONENTS USING A CRYOPUMPABLE REAGENT GAS

John Barry French; Neil M. Reid, both of Thornhill, and Janette A. Buckley, Willowdale, all of Canada, assignors to The Governing Counsel of the University of Toronto, Toronto, Canada

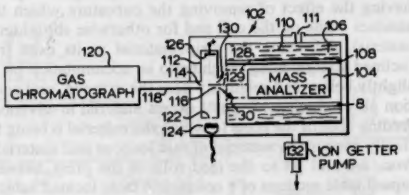
Continuation-in-part of Ser. No. 555,202, Mar. 3, 1975, Pat. No. 4,023,398. This application Apr. 25, 1977, Ser. No. 790,213
Int. Cl.[2] G01N *31/04*
U.S. Cl. 73—23 **5 Claims**

1. A method of analyzing a trace gas, comprising:

(1) introducing a reagent gas and said trace gas into a first region, said reagent gas being of the kind having a vapour pressure substantially less than atmospheric at a predetermined temperature and ions of said reagent gas being reactive with molecules of said trace gas to form trace gas ions,

(2) forming ions from said reagent gas in said first region and thereby forming ions of said trace gas,

(3) transporting said trace ions, with at least some of said reagent gas, into a vacuum chamber,



(4) cooling a surface in said vacuum chamber to below said predetermined temperature, so that said reagent gas will condense on said wall,

(5) guiding said ions of said trace gas along a selected path in said vacuum chamber, said path being spaced from said surface, and

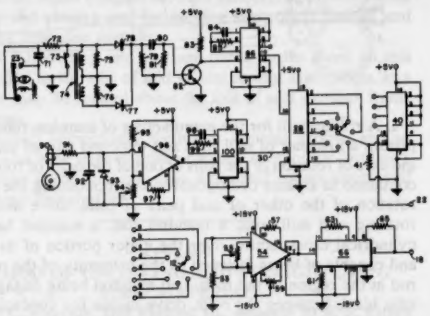
(6) analyzing said ions of said trace gas.

4,091,656

DETONATION ANALYZER FOR PISTON ENGINE

Arthur L. Altemose, Jr., Williamsport, Pa., assignor to Avco Corporation, Williamsport, Pa.

Filed May 12, 1977, Ser. No. 796,396
Int. Cl.[2] G01L *23/22*
U.S. Cl. 73—35 **6 Claims**



1. Apparatus for analyzing the detonation vibrations within each cylinder of an internal combustion engine having a rotating crankshaft, pistons connected thereto and spark plugs energized by a magneto for cyclically igniting the air-fuel mixture within each of said cylinders, said apparatus comprising:

a multiplicity of vibration sensors, one of said sensors being in contact with each cylinder of the engine being analyzed, each of said sensors providing an output signal that is an electronic replica of the vibrations going on within said cylinder;

a switch for selectively sampling the output of one of said multiplicity of vibration sensors;

first electronic circuitry means connected to the output of said switch means, said electronic circuitry means serving to amplify and filter the signal from the selected vibration sensor whereby the frequency band associated with the detonation phenomenon are amplified more than other frequencies;

an oscilloscope having a visual display and including a signal input terminal and a synchronizing pulse input terminal,

said signal input terminal being supplied by the output from said first electronic circuit means; and

second electronic circuitry means for generating a wave train of synchronizing pulses for injection into the synchronizing pulse input terminal of said oscilloscope, said second electronic circuitry means including:

a pulse generator connected to the output of said magneto and providing a conditioned output pulse each time said magneto ignites an engine cylinder,

a stepping counter having as many outputs as there are cylinders in the engine, said counter receiving conditioned pulses from said pulse generator at the engine firing rate,

a timing source producing a reset pulse in coincidence with the attainment of top-dead-center by the piston of number one cylinder of said engine, said reset pulse being used to return said stepping counter to its initial state, and

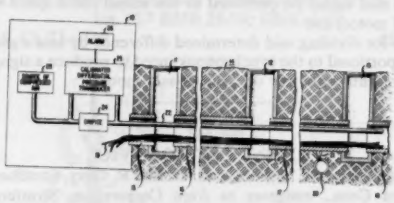
a switch for selecting one of the outputs of said stepping counter, said selection being for the purpose of obtaining a synchronizing pulse input for said oscilloscope, said synchronizing pulses being coincident with the passing of ignition pulses to the cylinder spark plugs.

4,091,657

HEAT DETECTING APPARATUS AND METHOD

Jesse Milne Jackson, Greensboro, N.C., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 20, 1976, Ser. No. 752,069
Int. Cl.² G01M *3/28*
U.S. Cl. 73—40 **2 Claims**



2. Apparatus to identify the approximate location of excessive temperature along an extended path through an environment, said apparatus comprising

a source of pressurized gas,

an orifice means having input and output ports with said input port connected to said source,

a thermoplastic tubing for extension along said path, said tubing being constructed and connected to said orifice output port so that under normal conditions the interior of said tubing has a pressure equal to that of said pressurized gas and, furthermore, the material for said tubing and the pressure for said gas being selected so that said tubing ruptures when at least a portion thereof is exposed to said excessive temperature, and

a differential pressure transducer connected between said orifice means input and output ports for producing an output related to the differential pressure between said ports in which said output is calibrated to indicate the location of the rupture with respect to said orifice means.

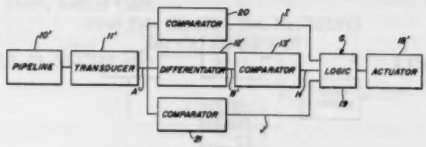
4,091,658

ELECTRONIC FLUID PIPELINE LEAK DETECTOR AND METHOD

Morris T. Covington, and Steven M. Griffin, both of Houston, Tex., assignors to Shafer Valve Company, Mansfield, Ohio

Division of Ser. No. 530,709, Dec. 9, 1974, Pat. No. 4,012,944. This application Dec. 8, 1975, Ser. No. 638,342
Int. Cl.² G01M *3/00*
U.S. Cl. 73—40.5 R **5 Claims**

1. A system for detecting breaks, leakages or the like in a liquid carrying pipeline or the like comprising means monitoring the pressure of the liquid in the pipeline and providing an output signal proportional thereto, means receiving the output signal proportional to pressure and providing an output signal proportional to the rate of change of pressure with respect to time, means comparing the output signal proportional to the rate of change of pressure with a preselected rate of change of



pressure representative of a surge in the liquid and providing an output signal when the output signal proportional to the rate of change of pressure exceeds the preselected rate of change of pressure, and means receiving the output of said last named means and initiating remedial measures.

4,091,659

APPARATUS FOR MEASURING WHITE CELL COUNT

James Vincent Massey, III, 80 Driftwood La., Trumbull, Conn. 06610; Robert Aaron Levine, 31 Pilgram La., Guilford, Conn. 06437, and Stephen Clark Wardlaw, 16 Pine Orchard Rd., Branford, Conn. 06405

Continuation-in-part of Ser. No. 673,058, Apr. 2, 1976, Pat. No. 4,027,660. This application Mar. 24, 1977, Ser. No. 781,048
Int. Cl.² B01D *21/26*
U.S. Cl. 73—61.4 **3 Claims**

1. For use in measuring the approximate white cell and platelet count in a centrifuged sample of anti-coagulated whole blood, an apparatus comprising: a tube for containing the centrifuged blood sample, said tube having a substantially constant diameter bore; a volume-occupying body having a specific gravity in the range of about 1.02 to about 1.09 disposed in said tube bore, said body having a side wall in the form of a substantially constant diameter cylinder over at least a majority of its extent, said body side wall and said tube bore combining to form an annular free volume in said tube operable to receive and axially elongate, by a multiple of at least about four, the extent of substantially all of the white cell and platelet layers; and means forming a channel extending longitudinally in said body and operable to allow passage of the plasma constituent of the blood sample during centrifugation so that the plasma will not substantially disrupt the interfaces between adjacent buffy coat cell layers during centrifugation, said channel having a small enough cross-sectional area so as not to collect a significant amount of buffy coat cells therein.

4,091,660

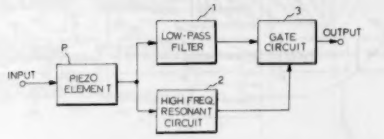
APPARATUS FOR DETECTING THE BREAKING OF A GLASS PLATE

Masahiro Yanagi, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 16, 1977, Ser. No. 778,324
Int. Cl.² G08B *13/04*
U.S. Cl. 73—658 **4 Claims**

1. An apparatus for detecting the breaking of a glass plate,

comprising: a piezoelectric element mounted on a glass plate for converting vibrations of said glass plate to an electrical signal; a signal separating circuit coupled to said piezoelectric element for separating said electrical signal into a first signal component corresponding to said electrical signal lower than 50 kHz and a second signal component corresponding to said



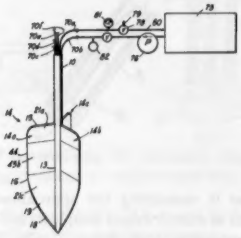
electrical signal higher than 100 kHz; and a gate circuit coupled to said signal separating circuit for receiving both of said first and second signal components and for producing an output signal only when both of said first and second signal components have signal levels higher than their respective predetermined levels.

4,091,661

METHOD AND APPARATUS FOR DETERMINING STRESS UNDERGROUND

Richard L. Handy, Ames; Eldon Glen Ferguson, Des Moines, both of Iowa; Richard D. Barksdale, Atlanta, Ga.; Nathaniel S. Fox, and Gary Trott, both of Marietta, Ga., assignors to Geotechnical Research, Inc., Marietta, Ga.

Filed Oct. 15, 1976, Ser. No. 732,940
Int. Cl.[2] G01B *5/30*
U.S. Cl. 73—88 E **16 Claims**



1. A sensor comprising:
(a) a standard;
(b) a sensing head carried on said standard, said sensing head including, a flat vane projecting from said standard, and a sensing cell within said vane, said sensing cell being of approximately the same thickness as said vane and having a deformable diaphragm with an outer surface being approximately coplanar to a surface of said vane;
(c) conduit means for directing fluid under pressure into said cell to deform said diaphragm outwardly when the exterior pressure on said diaphragm is exceeded by the pressure of said fluid; and
(d) means for monitoring the fluid to detect when the fluid has deformed the diaphragm.

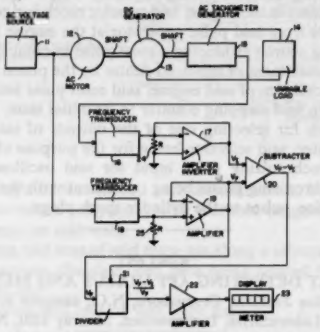
4,091,662

APPARATUS FOR TESTING THE PERFORMANCE OF ELECTRIC MOTORS

Ervin Mitchel Emanuel, P.O. Box 2175, Prairie View, Tex. 77445

Filed Jul. 18, 1977, Ser No. 816,386
Int. Cl.[2] G01D *1/16*
U.S. Cl. 73—116 **9 Claims**

1. Apparatus for measuring rotor slip in an electric motor comprising:
a source of alternating current voltage connected to the input of said motor for supplying power to said motor;
a variable inertia load connected to the output of said motor;
means connected to the output of said motor for producing a signal proportional to the actual rotor speed of said motor;
means connected to said source of alternating current voltage for producing a signal proportional to the synchronous rotor speed of said motor;



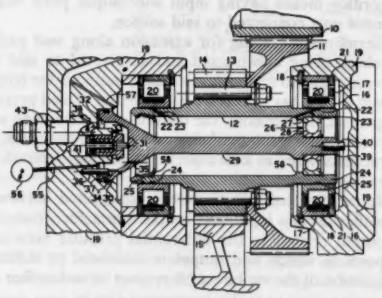
means for determining the difference between said signal proportional to the synchronous rotor speed of said motor and said signal proportional to the actual rotor speed of said motor; and
means for dividing said determined difference by said signal proportional to the synchronous speed to produce a signal representing the per unit slip of said motor.

4,091,663

TORQUE INDICATING DEVICE

Normand L. Lagasse, Milford, and Richard P. Cuny, Stratford, both of Conn., assignors to Avco Corporation, Stratford, Conn.

Filed Oct. 22, 1975, Ser. No. 624,689
Int. Cl.[2] G01L *3/02*
U.S. Cl. 73—136 R **7 Claims**



1. A device for indicating the torque exerted on a rotatable shaft adapted to transmit motion from an input helical gear to an output helical gear comprising:
a housing;
a pair of spaced anti-friction bearings mounted in the housing, each having outer and inner races, said outer race being fixed in said housing;
a lay shaft rotatably mounted through the inner races and being axially slidable therein, said shaft being constructed with at least one helical gear fixed thereon for engaging the input and output helical gears, said shaft thereby being subject to an axial force proportional to the torque being

transmitted from the input to the output gears, said axial force causing a proportional axial displacement of said shaft;

means for establishing a film of lubricating fluid between the lay shaft and said inner races of said pair of anti-friction bearings;

a piston operatively associated with one end of the lay shaft for axial displacement therewith;

a blind annular axial bore constructed in the housing to receive the piston and to accommodate limited axial movement thereof;

a source of pressurized lubricating fluid connected to the bore;

a valve connected to control the flow of pressurized fluid to the bore and operatively associated with the piston to vary said flow in response to the axial displacement of the lay shaft, thereby causing a fluid pressure which balances the axial force exerted on the shaft, regulates the displacement of said piston and is proportional to the torque transmitted through the shaft; and

means responsive to the fluid pressure in the chamber for generating a signal proportional thereto.

4,091,664

TIGHTENING WRENCH WITH ANGLE INDICATOR

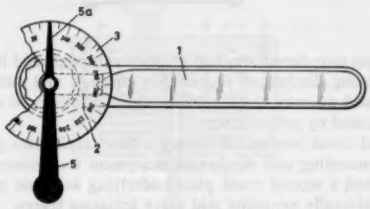
Hermann J. Zerver, Remscheid, Germany, assignor to Hazet-Werk Hermann Zerver, Remscheid, Germany

Filed May 10, 1976, Ser. No. 684,851

Claims priority, application Germany, May 10, 1975, 2520918

Int. Cl.[2] B25B *23/14*; G01L *5/24*

U.S. Cl. 73—139 **11 Claims**



1. A device for the controlled tightening of threaded fasteners with the aid of a visual reading of the angular tightening displacement executed by the device, the tightening device comprising in combination:

a tightening member adapted to be operatively connected to the threaded fastener, for the transmission of a tightening torque thereto;

a first angle indicating element in the form of a circular dial which is connected to the tightening member so as to be rotatable about an indication axis which is substantially parallel to the axis of rotation of the tightening member, when engaged with a threaded fastener; and

a second angle indicating element in the form of a pointer which is freely rotatable relative to the dial and the tightening member about said indication axis; and wherein

the two angle indicating elements define means for producing a visual reading of angular displacement of one element relative to the other;

the circular dial and the tightening member define between them cooperating friction surfaces which are located in the vicinity of the indication axis, so that the dial, while normally following the angular movements of the tightening member, is resettable with respect thereto by grasping its periphery with the fingers; and

the pointer includes means for establishing and maintaining for itself a fixed angular orientation, as determined by an ambient force field, said orientation remaining substantially unchanged, under the rotational movements of the tightening member and of the dial.

4,091,665

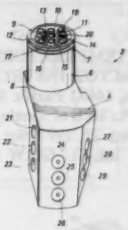
MULTI-PURPOSE WIND TUNNEL REACTION CONTROL MODEL BLOCK

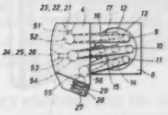
James C. Fletcher, Administrator of the National Aeronautics and Space administration, with respect to an invention of; Henry S. Dresser, La Mirada, and Joseph J. Daileda, Torrance, both of Calif.

Filed Feb. 11, 1977, Ser. No. 767,911

Int. Cl.[2] G01M *9/00*

U.S. Cl. 73—147 **8 Claims**





1. A multi-purpose nozzle assembly for reaction control testing of wind tunnel models, comprising

a nozzle block defining a plurality of jet nozzles disposed for control about at least one axis of said model,

nozzle supply means for selectively connecting said jet nozzles to a thrusting medium, and

plenum means disposed between said nozzle supply means and each said jet nozzle for obtaining thrust characteristics of each jet nozzle independent of the approach angle of said nozzle supply means.

4,091,666

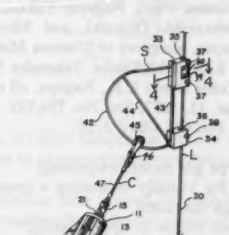
COMBINED HOUSING AND STANDARD FOR WATER FLOW METERS

Shale J. Niskin, 2941 Lacaya, Miami, Fla. 33133

Filed Jun. 27, 1977, Ser. No. 810,415

Int. Cl.[2] G01F *15/18*

U.S. Cl. 73—170 A **6 Claims**



1. A housing for a current flow meter comprising a substantially cylindrical member having an axis and end wall portions

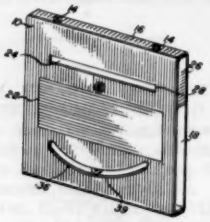
forming an enclosed chamber for receiving instruments therein, a pair of vanes mounted on said housing, each of said vanes lying substantially in a plane intersecting at substantially right angles at said axis of said housing, said vanes being substantially flexible, symmetrically disposed and tapering upwardly away from said housing and extending from one end of said housing to the other end and engaging said end wall portion at said other end, connecting means mounted at said one end of said housing for anchoring said housing in a body of water in determining current flow direction and velocity.

4,091,667

COMBINATION TEMPERATURE, WIND AND CHILL FACTOR INSTRUMENT

Gordon K. Anderson, 14632 Pacific St., and Steven M. Leuck, 14801 Briarcliff Pl., both of Tustin, Calif. 92680

Filed Aug. 29, 1977, Ser. No. 828,528
Int. Cl.[2] G01W *1/06*
U.S. Cl. 73—170 R **2 Claims**



1. An instrument for measuring simultaneously the ambient air temperature, air velocity and assertaining the wind chill factor comprising; a structural body containing a temperature measuring device having a resiliant element to captivate and enclose said device with a visual indicating portion in intimate contact with the structure and a calibrated scale located in close proximity on the external surface of the body, also a pendulum indicator so positioned as to move freely in an arc as acted upon by wind velocity impinging on a pendulum bob and connectling link, enclosed within said body limiting lateral movement, with a corresponding calibrated scale integral with the body, together with visual indication of the temperature-wind speed relationship so as to interpret the so-called wind chill factor also permanently affixed to or integral with the body.

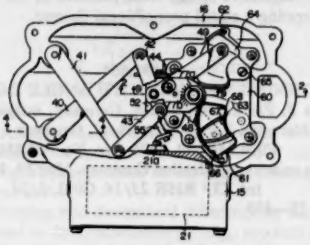
4,091,668

DIAPHRAGM TYPE GAS METER

Kosuke Namikawa, Yokohama; Hajime Onoda, Tokyo; Mineo Okamoto, Kyoto; Isamu Fujii, Nagoya; Takaaki Matsuda, Chita; Mustuo Uebayashi, Okazaki, and Hirosi Suzuki, Funabashi, all of Japan, assignors to Kimmon Manufacturing Co., Ltd., Tokyo; Kabushiki Kaisha Takenaka Seisakusho, Osaka and Aichi Tokei Denki K.K., Nagoya, all of, Japan

Filed Mar. 11, 1977, Ser. No. 776,732
Int. Cl.[2] G01F *3/20*
U.S. Cl. 73—263 **13 Claims**

1. A diaphragm type gas meter comprising:
a counter section for visually indicating a quantity of gas delivered through the meter;
a valve cage formed within an upper casing;
measuring chambers formed within a lower casing, said lower casing having a gas discharge passage;
a gas inlet port formed on said upper casing and opening into said valve cage;
a distributing valve means provided with said valve cage and including valve members and a plurality of valve chambers;
a gas outlet port formed on said upper casing and opening into one of discharge-side valve members of said distributing valve means through said discharge passage of said lower casing;
a crank mechanism provided within said valve cage and including a crank shaft coupled to said counter section;
valve actuating levers connected to said valve members;
diaphragm movement transmission levers coupled operatively by said crank mechanism, said diaphragm movement transmission levers protruding from said valve cage into said measuring chamber, the protruding bottom ends of said levers being supported by blade shafts rotatably supported by bearings;
rockable blades fixed to said blade shafts for supporting measuring diaphragms defining said measuring chambers;
diaphragm control wall means provided within said measuring chambers and having diaphragm control surfaces for restricting stroke ends of reciprocation of said measuring diaphragms, said valve members reciprocating through fixed strokes according to the reciprocation of said measuring diaphragms by gas pressure;



a gas introduced into said gas meter through said inlet port being discharged successively through said outlet port, said quantity of the gas flowed being integrated and indicated by said counter;
said crank mechanism having a first crank plate pivotally mounting said diaphragm movement transmission levers and a second crank plate underlying said first plate and pivotally mounting said valve actuating levers;
a supporting means comprising a projection on one of the first and second crank plates and a hole in the other of the first and second crank plates for allowing the projection to fit therein;
a control means for controlling the relative rocking angle of both said plates to adjust the angle of advance of the gas meter;
a fixing means for fixing said plates to each other so as to rotate said plates as a body around said rocking center; and
a means for bringing said rocking center of both said plates in line with the central axis of said crank shaft.

4,091,669

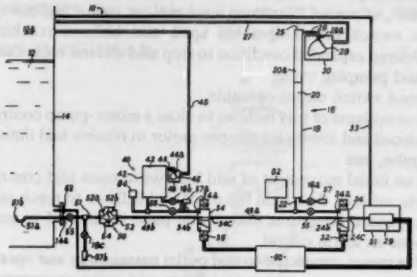
PRESSURE RESPONSIVE APPARATUS

Ivor John Martin Fehr, Basingstoke, and Desmond Wheable, Overton, both of England, assignors to Bell & Howell Limited, Basingstoke, England

Filed Nov. 11, 1976, Ser. No. 740,791
Claims priority, application United Kingdom, Nov. 18, 1975, 47557/75
Int. Cl.[2] G01F *23/14*
U.S. Cl. 73—299 **24 Claims**

1. Apparatus suitable for use as a pressure standard, comprising a reference container arranged, in use, to have a predetermined orientation and to be charged with a liquid whereby the pressure at a port in the lower part of the container is at a predetermined value, and wherein the container is sealed at an upper part by a closure member having characteristics such

that the space above the liquid within the container is isolated from the external environment while being maintained at a



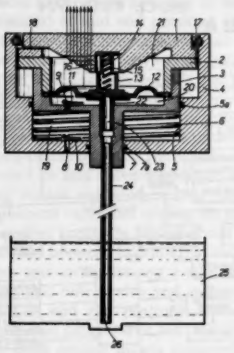
pressure substantially equal to the pressure of the external environment.

4,091,670

PUSH-BUTTON OPERATED METER

Géerard Mantoux, Bois d'Arcy, France, assignor to Bertin & Cie, Plaisir, France

Continuation of Ser. No. 560,379, Mar. 20, 1975, abandoned. This application Oct. 19, 1976, Ser. No. 734,016
Claims priority, application France, Mar. 21, 1974, 74 09607
Int. Cl.[2] G01F *23/16*
U.S. Cl. 73—302 **4 Claims**



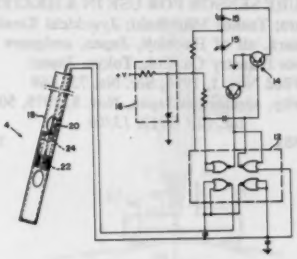
1. A liquid level gauge of the kind providing a lasting visual reading upon hand actuation of a liquid head measuring sensor, said gauge comprising a complex which includes relatively movable index means controlled by said sensor and providing said visual reading, said measuring sensor comprising a flexible diaphragm and a liquid head sensing tube operatively associated with said diaphragm, and a push-button which overlies said index means and carries a portion of the same in the inside of said push-button, said push-button having a transparent depressible actuator head, a stationary body, a first part fast with said depressible head, a second part fast with said first part, said flexible diaphragm being gripped peripherally between said parts and defining with said second part a pressure chamber into which said sensing tube opens, said second part being sealingly guided for slidable movement with respect to said stationary body and defining therewith piston pump chamber, and valve means carried by said second part for controllably communicating said chambers with each other, whereby said index means is visible through said overlying transparent head which shields it from shocks and soil, and is moreover movable jointly with said index means carrying head.

4,091,671

ELECTRONIC FLUID LEVEL SENSOR

Donald J. McLees, 2623 Virginia, Everett, Wash. 98201

Continuation-in-part of Ser. No. 756,761, Jan. 5, 1977, abandoned. This application Jul. 20, 1977, Ser. No. 817,231
Int. Cl.[2] G01F *23/10*
U.S. Cl. 73—313 **10 Claims**



1. A fluid level sensor comprising:

a small diameter solenoid type induction coil having substantially contiguous windings and of a length comparable to the maximum dimension of a buoyant metallic means, captured for movement substantially axially with respect to the coil from a point intermediate the ends of the coil to a point exterior of the coil,

a solid state oscillator utilizing the coil is an inductive component,

detection circuitry responsive to the oscillator to determine if the buoyant metallic means is inside or outside the coil, and

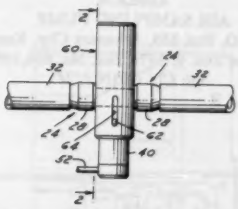
means responsive to the output signal of the circuitry for performing a predetermined function.

4,091,672

TEMPERATURE PROBE AND CONNECTOR

Bruce A. Amrine, and Philip J. Teders, both of Ann Arbor, Mich., assignors to Sarns, Inc., Ann Arbor, Mich.

Filed Jun. 9, 1977, Ser. No. 804,948
Int. Cl.[2] G01K *1/16, 13/02*
U.S. Cl. 73—343 R **10 Claims**



1. A non-invasive temperature probe for monitoring blood temperature in extracorporeal circulation system which comprises:

(a) a connector tube formed of metal with a relatively high heat transfer characteristic adapted to be connected into an extracorporeal blood line,

(b) a temperature probe for connection to a telethermometer comprising a highly conductive metal sensing element shaped on one surface in a cylindrical concavity to match the outer diameter of the connector tube, and a lead wire connected to said sensing element for connection to a telethermometer, and

(c) means to mount said sensing element on said tube comprising a first body member having a transverse recess

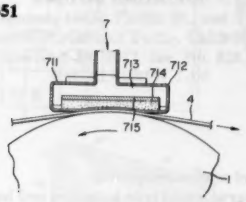
adjacent said sensing element and a second body member movably associated with said first body member having portions to contact said connector tube to urge said tube into contact with said sensing element.

4,091,673

TEMPERATURE SENSOR FOR USE IN A HEATED ROLL

Takashi Tamura; Tsuneo Matsuzaki; Jyunkichi Kasahara, and Ken Nakamura, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co. Ltd., Tokyo, Japan

Filed Nov. 1, 1976, Ser. No. 737,669
Claims priority, application Japan, Nov. 8, 1975, 50-134469
Int. Cl.[2] G01K *13/08*
U.S. Cl. 73—351 **12 Claims**



1. In a heated roll fixing system for fusing toner images, including a rotatable heated fuser roll, a pressure roll disposed in pressure contact with said heated fuser roll to form a nip through which a support material carrying thereon toner images is moved to fuse the toner images on said support material, a cleaning web extending between a web supply spool and a web take-up spool, said web being positioned to contact the peripheral surface of said fuser roll to remove fused toner particles deposited on said surface, a temperature sensing device for said heated fuser roll comprising:

an insulated support member;

a thermocouple extending around and being supported by said insulated support member; and

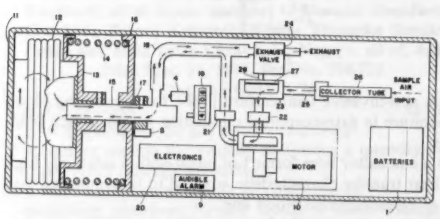
a resilient member interposed between said insulated support member and said thermocouple, said temperature sensing device being positioned so that at least a portion of said thermocouple is in thermal contact with the peripheral surface of said heated fuser roll.

4,091,674

AIR SAMPLING PUMP

Guy C. Amey, P.O. Box 133, Arkansas City, Kans. 67005

Filed Jun. 9, 1976, Ser. No. 694,109
Int. Cl.[2] G01N *1/24*
U.S. Cl. 73—421.5 R **8 Claims**



1. An air-sampling pump system for drawing air through a collection device, comprising:

an electric motor driven air pump having an inlet and outlet,

an inlet passageway,

means for sealably connecting the inlet passageway in series with the collection device,

a normally collapsed bellows, an outlet passageway sealably connecting the outlet of said pump with the interior of the bellows,

electrical power supply and timing pulse circuit means to start, at pre-set frequency, said electric motor and pump,

first switch means operable upon said bellows reaching desired expanded condition to stop said electric motor and said pumping cycle;

second switch means operable

(1) on collapse of said bellows to close a motor-pump control circuit and allow said electric motor to receive said timing pulse, and

(2) on initial movement of said bellows to open said control circuit such that upon failure of said bellows to reach said expanded condition, said timing pulse is directed to activate an alarm circuit;

valve means connected to said outlet passageway and operable to an open position to exhaust said outlet passageway and permit said bellows to collapse and to a closed position, at the start of said pump, to permit said bellows to expand; and

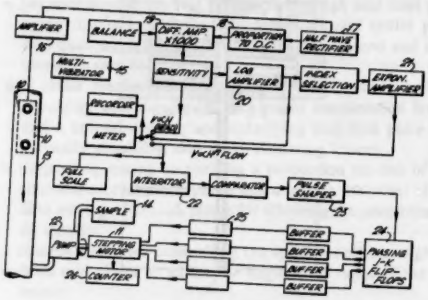
counter means to indicate the number of times said bellows has reached said expanded condition.

4,091,675

SAMPLERS

William Jennison, Thurso, Scotland, assignor to United Kingdom Atomic Energy Authority, England

Continuation of Ser. No. 551,080, Feb. 20, 1975, abandoned. This application Dec. 29, 1976, Ser. No. 755,242
Claims priority, application United Kingdom, Mar. 8, 1974, 10609/74
Int. Cl.[2] G01N *1/14*
U.S. Cl. 73—422 R **2 Claims**



1. A liquid proportional sampler comprising an insulated electrode capable of being inserted in a flowing liquid and a further electrode forming with the first-mentioned electrode a capacitor with an electrical output which is dependent on the depth of insertion of the electrodes in the flowing liquid; a stepping motor driven pump for continuousiy taking a sample volume from the liquid; means connected to said electrodes for alternately charging and discharging the capacitance between the electrodes; means connected to said electrodes for converting the charging current of said electrodes into a voltage analogue; means connected to said converting means for raising said voltage analogue to a predetermined power index correlating the depth of insertion of the electrodes and the pressure head of the flowing liquid to produce a flow analogue signal; and means for converting said flow analogue signal into a pulse train to operate the stepping motor so that said pump takes from the flowing liquid a sample volume proportional to the flow of liquid, said means for raising said voltage analogue comprising a logarithmic amplifier and an exponential amplifier and said power index being greater than 1.0 and less than 2.5.

4,091,676

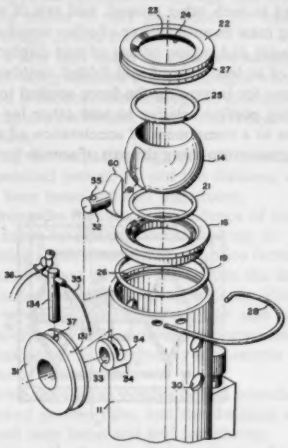
WATER SAMPLE COLLECTING DEVICE

Shale J. Niskin, 2941 Lucaya, Coconut Grove, Fla. 33133

Continuation-in-part of Ser. No. 691,905, Jun. 1, 1976, Pat. No. 4,037,477. This application Apr. 18, 1977, Ser. No. 788,588

Int. Cl.[2] F16J *15/32*; G01N *1/10*

U.S. Cl. 73—425.4 R 7 Claims



1. In a water sample collecting device having a tubular member with open end portions, an internal peripheral shoulder mounted about said tubular member in said end portions, valve means mounted at said end portions, said valve means comprising inner valve seat means having an external peripheral shoulder, said inner valve seat means being responsive to the pressure of the water sample collected at a predetermined depth and slidably positioned at the inner end of said end portions in proximity of said internal peripheral shoulder, a spherical valve seated on said valve seat means, a substantially centrally disposed opening in said valve seat means, a peripheral groove formed on said valve seat means about said opening, first sealing means mounted in said peripheral groove engaging said spherical valve and sealing the juncture therebetween, second sealing means mounted about said valve seat means and positioned between said internal and external shoulders, outer valve seat means having a substantially centrally disposed opening, said outer valve seat means being mounted at the outer end of said end portions, a second peripheral groove formed on said outer valve seat means about said last named opening, third sealing means mounted in said second peripheral groove engaging said spherical valve and means securing said outer valve seat means to said tubular member.

4,091,677

PIPETTING APPARATUS

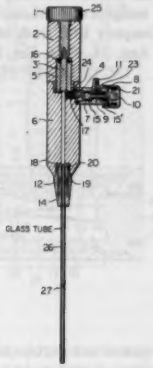
Yuji Oshikubo, Sakura, Japan, assignor to Nichiryo Co., Ltd., Tokyo, Japan

Filed Dec. 23, 1976, Ser. No. 754,030

Int. Cl.[2] G01N *1/14*

U.S. Cl. 73—425.6 5 Claims

1. A pipetting apparatus comprising an elongated housing, a liquid receiving tube for receiving a predetermined amount of liquid therein and one end of which is attached to one end of said housing whereby said tube axially extends from said housing, cylinder piston means disposed in the housing adjacent the other end of said housing and in axial alignment with said tube for applying vacuum pressure on said one end of said tube to suck the liquid therein, a manually operable device for actuating said cylinder piston means and located in said other end of said housing and extending outwardly therefrom, an air inlet for being connected to a source of compressed air which is employed to discharge liquid from said tube, and a manually operable valve located in a valve housing extending laterally from said elongated housing for selectively communicating the air inlet with said one end of the liquid receiving tube to discharge liquid from said tube, said manually operable valve including two valve members co-axially and integrally disposed within said valve housing and connected to a push button, said valve members cooperating with two valve seats



respectively, whereby when said push button is depressed to discharge liquid from said apparatus, one of said valve members engages its corresponding valve seat to cut off communication between said air inlet and atmosphere while the other valve member is separated from its corresponding valve seat to thereby communicate said air inlet with said one end of the liquid receiving tube whereby the liquid received in the liquid receiving tube is discharged quickly and thoroughly.

4,091,678

PIPELINE LIMIT DENT DETECTOR

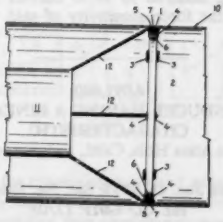
David Walter Potter, West Hill, Canada, assignor to Trans Canada Pipelines Limited, Toronto, Canada

Filed May 4, 1977, Ser. No. 793,771

Claims priority, application United Kingdom, May 11, 1976, 19343/76

Int. Cl.[2] G01N *19/08*

U.S. Cl. 73—432 R 13 Claims



1. A device for detecting dents in pipe comprising:

a first annular member having an outside diameter equal to the inner diameter of the pipe to be inspected;

a second annular member having an outside diameter less than the inner diameter of said first member;

means for locating said second member concentric with said first member and means for maintaining said first and second members in substantially the same plane;

said first member having an electric contact;

said second member having an electric contact for cooperation with said electric contact on said first member when

said first member is radially deformed inwardly toward said second member;

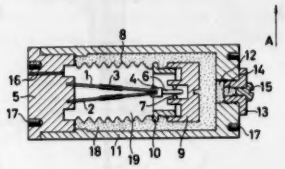
said first member being more readily radially deformable than said second member.

4,091,679

VIBRATING QUARTZ ACCELEROMETER

Kaoru Furusawa, Kawasaki, and Sumiyuki Ishigami, Yokohama, both of Japan, assignors to Meisei Electric Co., Ltd. and Tokyo Denpa Company Ltd., both of Tokyo, Japan

Filed Aug. 24, 1976, Ser. No. 717,136
Int. Cl.² G01P *15/10*
U.S. Cl. 73—497 **13 Claims**



1. A vibrating quartz accelerometer for a moving object, comprising: two plane-shaped quartz resonators each having two ends and two plane surfaces, both ends of the resonators being rigidly coupled to each other so as to cause their surfaces to confront each other and so as to form a gap between the surfaces, one pair of coupled ends being fixed to the moving object and the other pair being free to move relative to the object, a weight, coupling means for coupling the free ends of the resonators and the weight to each other, so that when said moving object is placed in motion the inertial force which acts on the weight in a direction that maintains the original state of motion or standstill may be converted into a beat frequency, the resonant frequencies of said two quartz resonators which beat frequency may be sensed to detect acceleration of the moving object, a bellows which is expansible and contractible along the direction of the horizontal line of the vibrating quartz resonators, is formed to have said resonators therein and is provided between the fixed end of said resonators and the weight, said coupling means forming coupling points between said weight and said vibrating quartz resonators, the points being shiftable along the direction of expansion and compression of said bellows, said weight and bellows being surrounded by damping material, and the position of the coupling points being shiftable by volume changes due to temperature changes of said damping material so as to correct the temperature dependence of the force sensitivity of said vibrating quartz resonators.

4,091,680

FORCE TRANSDUCER HAVING A LINEAR TRANSFER CHARACTERISTIC

Barry Block, Los Altos Hills, Calif., assignor to Diax, Los Altos Hills, Calif.

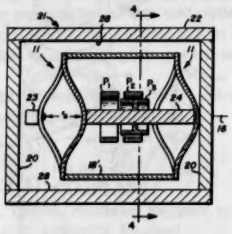
Filed Jun. 16, 1975, Ser. No. 586,892
Int. Cl.² G01P *15/08*
U.S. Cl. 73—517 R **2 Claims**

2. In an apparatus for converting an acceleration or a gravitational force to an output:

first and second folded cantilever leaf spring portions, each of said folded cantilever leaf spring portions including first and second generaly parallel leg portions extending outwardly from an axis of sensitivity, coupling means for coupling together the outer ends of said parallel leg portions, said coupling means being free to move both parallel to and perpendicular to the axis of sensitivity in response to displacement of the inner end of one of said leg portions relative to the inner end of the other leg portion, said leg portions being dimensioned to have a higher compliance along the axis of sensitivity that the compliance thereof perpendicular to the axis of sensitivity;

means for coupling together said first and second folded cantilever leaf spring portions into a composite spring structure so that said first and second ones of said folded cantilever spring portions of said composite structure extend outwardly from, and are angularly displaced with respect to each other around, said axis of sensitivity;

a sensing mass essentially free of other structutre coupled to said inner end region of one of said displaceable leg portions of at least one of said folded cantilever leaf spring portions for increasing the force applied to said displaceable leg portion relative to said other leg portion in response to a component of acceleration of said composite spring structure along the axis of sensitivity or in response



to a component of gravitational force field applied to said composite spring structure along the axis of sensitivity;

means for deriving an output from said composite spring structure which is proportional to the component of applied force tending to displace said inner end of one of said leg portions relative to the other along said axis of sensitivity; and

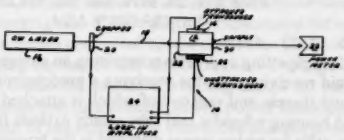
squeeze film damping means having a stationary wall portion disposed adjacent and closely spaced to said displaceable leg portion of said folded cantilever leaf spring portion for squeezing a film of fluid from in between said displaceable leg portion of said folded cantilever leaf spring and said stationary wall portion in response to displacement of said displaceable leg portion in the direction of the axis of sensitivity.

4,091,681

METHOD FOR THE SIMULTANEOUS DETERMINATION OF LOW OPTICAL BULK AND SURFACE ABSORPTION COEFFICIENTS IN SOLIDS

Audun Hordvik, Trondheim, Norway, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 21, 1977, Ser. No. 808,495
Int. Cl.² G01H *1/00*
U.S. Cl. 73—574 **4 Claims**



1. A method for simultaneously determining small bulk and surface absorption coefficients in a solid sample comprising the steps of:

(1) placing said solid sample in optical alignment with a laser beam emanating from a laser;

(2) attaching a transducer to one surface of said solid sample,

said transducer being capable of providing data in order to yield substantially different functional dependent curves of bulk and surface absorption based on voltage divided by power versus distance of said transducer to said laser beam;

(3) placing means adjacent said sample for detecting the amount of power transmitted through said sample;

(4) attaching means to said transducer for measuring the output voltage of said transducer;

(5) passing a first laser beam through said sample, said first laser beam being selected at a wavelength where the bulk absorption is the dominant absorption mechanism and the bulk absorption coefficient can be determined by conventional means;

(6) measuring the output voltage of said transducer, Vout, said transmitted power, P_t, and the distance, *d*, between said first laser beam and said transducer;

(7) determining the functional dependence of said bulk absorption curve by plotting Vout/P_t versus *d;*

(8) determining a bulk absorption calibration factor by calculating the absorbed power, Pabs, from the known bulk absorption coefficient and taking the ratio Vout/Pabs;

(9) passing a second laser beam through said sample, said second laser beam being selected at a wavelength where all incident power is absorbed by said sample in the first few tenths of millimeters;

(10) measuring the output voltage of said transducer, Vout, the absorbed power, Pabs, and the distance, *d*, between said second laser beam and said transducer;

(11) determining the functional dependence of said surface absorption curve by plotting Vout/Pabs versus *d* which then also determines the surface absorption calibration factor;

(12) passing a third laser beam through said sample, said third laser beam being at any desired wavelength wherein the surface and bulk absorption coefficients are unknown;

(13) measuring the output voltage of said transducer, Vout, the transmitted power, P_t, and the distance, *d*, between said third laser beam and said transducer;

(14) determining the combined surface and absorption curve by plotting Vout/P_t versus *d;*

(15) generating the surface absorption curve for said third laser wavelength by utilizing a point where said voltage measured in step 13 is due only to surface absorption, said point being determined from step 7 at a distance where said Vout is zero;

(16) generating the bulk absorption curve for said third laser wavelength by algebraically subtracting the surface absorption curve generated in step 15 from the combined surface and absorption curve found in step 14; and

(17) calculating the surface and bulk absorption coefficients from the data obtained from the surface and bulk absorption curves generated in steps 15 and 16, respectively, and the calibration factors determined in steps 8 and 11, respectively.

4,091,682

DIGITAL DIFFERENTIAL PRESSURE MEASUREMENT APPARATUS

Arthur Robert Abbott, and Walter Clark Milliken, both of Dover, N.H., assignors to Sensor-Matic, Inc., Sparta, N.J.

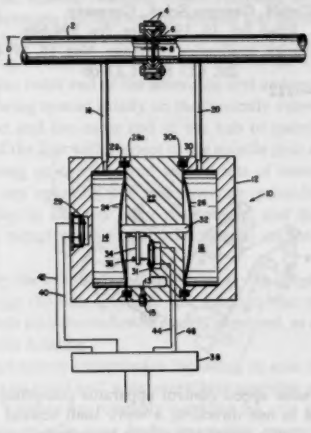
Filed Apr. 4, 1977, Ser. No. 783,966
Int. Cl.[2] G01L *9/08*
U.S. Cl. 73—702 **9 Claims**

1. Digital pressure differential measurement apparatus comprising:

a first electromechanical transducer adapted to provide a first series of pulses at a first frequency;

a second electromechanical transducer adapted to provide a second series of pulses at a second frequency, which second frequency is inversely related to a force applied to said second transducer;

force applying means responsive to a pressure differential adapted to apply a force, directly related to said pressure differential, to said second transducer; and



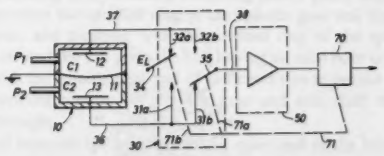
modulator means adapted to receive said first and second series of pulses and to provide a third series of pulses at a third frequency, said third frequency being related to the difference between said first and second frequencies.

4,091,683

SINGLE CHANNEL ELECTRICAL COMPARATIVE MEASURING SYSTEM

Leroy C. Delatorre, Houston, Tex., assignor to Panex, Inc., Houston, Tex.

Filed Sep. 27, 1976, Ser. No. 726,771
Int. Cl.[2] G01L *9/12*
U.S. Cl. 73—718 **18 Claims**



1. Apparatus for processing measured parameters including:

sensing means for receiving two parameters to be measured and for providing two capacitance measurement values respectively functionally related to the parameters received by said sensing means,

a single channel means responsive to such capacitance measurement values for producing output signals with frequencies functionally related to such capacitance measurement values from said sensing means,

means for providing a reference voltage, and

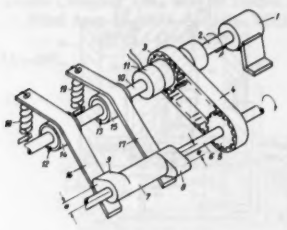
means for alternately coupling said reference voltage and said single channel means to said sensing means for referencing a capacitance measurement value alternately to said voltage reference and applying a capacitance measurement value to said single channel means.

4,091,684

VARIABLE SPEED CONTROL APPARATUS

Werner Lehmann, Gutach, Germany, assignor to Mathias Bauerle GmbH, Georgen,Schw., Germany

Filed Jul. 10, 1975, Ser. No. 594,666
Claims priority, application Germany, Nov. 15, 1974, 2454201
Int. Cl.[2] F16H *27/00*
U.S. Cl. 74—112 11 Claims



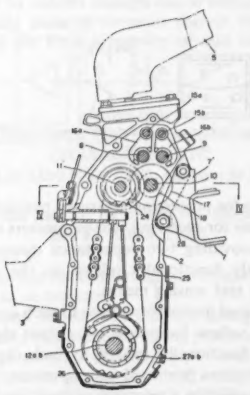
1. A variable speed control apparatus comprising a drive shaft driven in one direction, a work shaft coaxial with said drive shaft, clutch means selectively interconnecting the drive shaft and said work shaft whereby in a first working mode the work shaft is in direct driven relation with the drive shaft and at the velocity thereof, a cam shaft spaced from and parallel to said work shaft, said cam shaft being drivingly connected to said drive shaft for rotation therewith, coupling means on said work shaft, actuator means carried by said cam shaft, lever means extending between said actuator means and said coupling means, said coupling means and actuator means being constantly driven by said drive shaft whereby in a second working mode when said clutch means is disengaged the work shaft is driven intermittently and incrementally.

4,091,685

SPEED CHANGE UNIT FOR TILLER

Masamitsu Shingaki; Tomeo Umemoto; Mitsuhiro Sato, all of Sakai, Japan, and Mikio Yuki, Vichy, France, assignors to Kubota, Ltd., Japan

Filed Oct. 15, 1976, Ser. No. 732,868
Claims priority, application Japan, Nov. 4, 1975, 50-150310[U]; Dec. 27, 1975, 50-179339[U]
Int. Cl.[2] F16H *3/08*
U.S. Cl. 74—331 1 Claim



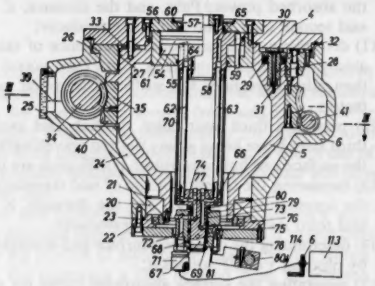
1. A speed change unit for a tiller comprising a first shaft for speed change serving as an input shaft, a second shaft for speed change, a third shaft serving as an intermediate transmission shaft for axles, the first, second and third shafts being disposed in parallel to one another and supported by a propulsion transmission case, a first shift gear splined or keyed to the first shaft and having a large width axially thereof, a second shift gear splined or keyed to the second shaft and having a large width axially thereof, the second shift gear always meshing with the first shift gear, a first driven gear freely rotatably mounted on the third shaft and selectively meshable with the first shift gear or the second shift gear, and a second driven gear fixedly mounted on the third shaft and selectively meshable with the first shift gear or the second shift gear, thereby the rotation of the first driven gear or the second driven gear on the third shaft can be delivered to a transmission system for the axles via two transmission systems different in speed change ratio and same in the direction of transmission of rotation.

4,091,686

DRIVE MECHANISM FOR THE SPINDLE OF A TOOL MACHINE

Max Seitz, Munich, Germany, assignor to Carl Hurth Maschinen- und Zahnradfabrik, Munich, Germany

Filed Jan. 26, 1977, Ser. No. 762,750
Claims priority, application Germany, Jan. 28, 1976, 2603091
Int. Cl.[2] F16H *55/18, 1/02, 1/16*
U.S. Cl. 74—409 7 Claims



1. In a drive mechanism for a spindle rotatably mounted on a tool machine having worm gearing with play compensation provided by a first worm, the improvement comprising wherein said spindle is connected to and driven by a second worm of said worm gearing, drive means on said spindle for driving said first worm, the helix angle of said first worm being outside of the automatic locking area, and a brake device coupled to said first worm for resisting rotation thereof to effect an application of a rotation resisting load on said spindle and a backlash fee connection of said spindle to said worm gearing.

4,091,687

HIGH-SPEED ROTATION SYSTEM

Peter Meinke, Grossinzemoos, and Kurt Fiedler, Hamburg, both of Germany, assignors to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Munich and Gutehoffnungshutte Sterkrade Aktiengesellschaft, Oberhausen, both of, Germany

Filed Jan. 28, 1977, Ser. No. 763,626
Claims priority, application Germany, Feb. 2, 1976, 2603882
Int. Cl.[2] F16F *15/10*
U.S. Cl. 74—574 11 Claims

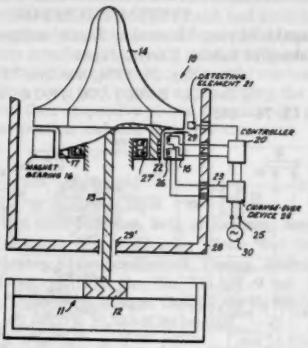
1. A high-speed rotation system susceptible to vibration comprising:

a relatively thin and flexible shaft having first and second ends;

a rotating member disposed on the first end of said shaft;

a planetary gear including a torque-transmitting sun gear

cooperating with said shaft, said sun gear being connected to and restraining the second end of said shaft, and



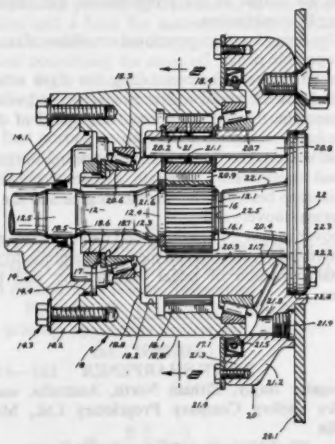
magnetic bearing means surrounding at least part of said rotating member system, for damping the vibration of said rotation system.

4,091,688

EASILY ASSEMBLED AND DISASSEMBLED PLANETARY GEAR ASSEMBLY

Roger B. Huffman, Chanhassen, Minn., assignor to Dana Corporation, Toledo, Ohio

Filed Sep. 1, 1976, Ser. No. 719,815
Int. Cl.² F16H *3/44, 35/00, 57/10*
U.S. Cl. 74—785 **7 Claims**



1. In a planetary transmission including an axle shaft with a sun gear at its outer end, a planetary gear assembly comprising a stationary axle housing for rotatably carrying the axle shaft; a unitary spindle gear body removably mounted to and extending axially outwardly of the axle housing in circumferential relationship to the axle shaft and having a recessed interior with an inner surface having formed therein a toothed ring surrounding but spaced radially from the sun gear; a hub rotatably mounted to and extending axially outwardly of the spindle gear, the hub carrying a plurality of spaced, rotatable planet gears disposed between the toothed ring of the spindle gear and the sun gear and meshing therewith, the hub having a aperture coaxial with the spindle gear and of sufficient size to permit axial outward removal of the sun gear and axle shaft therethrough; the hub including an inwardly extending annular portion disposed between the axle shaft and the spindle gear, a first set of bearings axially inward of said ring rotatably mounting the annular portion of the hub adjacent its inner end to the spindle gear bearing retaining means retaining the first set of bearings between the hub and the spindle and permitting separation of the same, and a second set of bearings axially outward of said ring rotatably mounting the hub to the spindle gear adjacent the outer end of the latter, the first and second sets of bearings being spaced axially on the inwardly extending annular portion and the outer end of the hub to maintain coaxial rotation of the hub with respect to the spindle gear and balance forces acting on the first and second sets of bearings; and a removal cap covering the hub aperture providing ease of accessibility to the sun gear, the spindle, and the hub and including means restraining outward axial movement of the axle shaft,

whereby the axle shaft and sun gear may be simply removed through the hub aperture, and whereby the spindle gear and hub may thereafter be readily removed, as a unit, from the axle housing.

6. In a planetary transmission including an axle shaft with a sun gear at its outer end, a planetary gear assembly comprising:

an axle housing for rotatably carrying the axle shaft;

a unitary spindle gear body removably mounted to, and extending axially outwardly of, the axle housing in circumferential relationship to the axle shaft and having a recessed interior with an inner surface having formed therein a ring of inwardly projecting teeth surrounding but spaced from the sun gear;

a hub rotatably mounted to and extending axially outwardly of the spindle gear, the hub having an inwardly extending annular portion disposed between the axle shaft and the spindle gear, a first set of bearings axially inward of said ring rotatably mounting the annular portion of the hub adjacent its inner end to the spindle gear bearing retaining means retaining the first set of bearings between the hub and the spindle and permitting separation of the same, a second set of bearings axially outward of said ring rotatably mounting the hub to the spindle gear adjacent the outer end of the latter, the first and second set of bearings being spaced axially on said inwardly extending annular portion and said outer end of said hub to maintain coaxial rotation of the hub with respect to the spindle gear and balance forces acting on the first and second sets of bearings, and the hub including a plurality of axially inwardly extending pins rotatably mounting planet gears disposed between the toothed ring of the spindle gear and the sun gear, and meshing with the toothed ring of the spindle gear and the sun gear, the hub having an axial bore coaxial with the spindle gear and of sufficient size to permit axial outward removal of the sun gear and axle shaft therethrough;

a seal between the spindle and the outer end of the hub and a seal between the axle housing and axle forming a sealed enclosure serving to lubricate the first and second set of bearing, the planet gears, and the plurality of axially inwardly extending pins;

the body of the spindle gear being free from obstructions preventing axially outward removal therefrom of the inwardly extending annular portion of the hub;

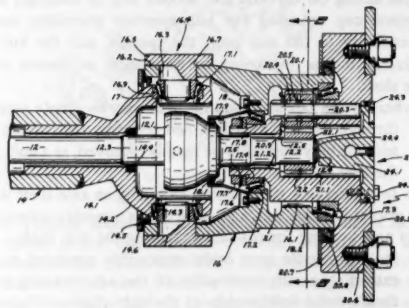
a cap removably mounted to exteriorly cover the hub bore, the cap including restraining means projecting inwardly of the hub bore for restraining outward axial movement of the axle shaft therefrom and for providing ease of accessibility to the sun gear, the spindle, and the hub; and

whereby the axle shaft and sun gear may be simply removed through the hub bore, and whereby the spindle gear and hub may be readily removed as a unit from the axle housing.

4,091,689
PLANETARY STEERING HUB ASSEMBLY

Roger B. Huffman, Chanhassen, Minn., assignor to Dana Corporation, Toledo, Ohio

Filed Sep. 1, 1976, Ser. No. 719,814
Int. Cl.[2] F16H 3/44, 35/00
U.S. Cl. 74—785 7 Claims



1. A planetary gear steering hub assembly comprising:

a stationary axle housing;

an axle shaft extending outwardly through the housing and having a universal joint spaced from its outer end and defining a pivotal outer shaft end portion;

a sun gear removably and coaxially mounted to the outer end of the axle shaft;

a hollow, generally tubular spindle body pivotally coupled at one end to the axle housing for pivotal movement about a generally upright axis, the spindle having adjacent its other end an interior surface having formed therein a toothed ring surrounding but spaced from the sun gear, the axle housing includes a spherical outer surface, and the spindle includes a seal slideably sealing engaging the spherical surface and a seal sealing the spindle to the outer end portion of the axle shaft axially inwardly of the sun gear;

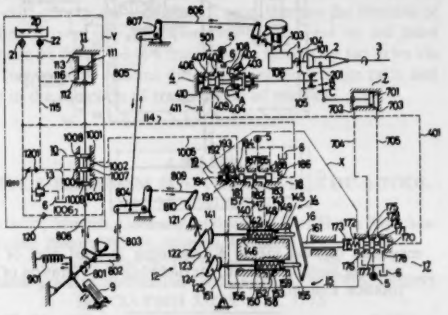
a hub rotatably mounted to and carried coaxially with the spindle, the hub extending outwardly of the spindle and carrying a plurality of spaced, rotatable planet gears disposed between the sun gear and the toothed ring and meshing therewith and includes an annular portion disposed between the axle shaft and the spindle, a first set of bearings axially inward of said ring rotatably mounting the annular portion of the hub adjacent its axially inner end to the spindle, bearing retaining means restraining the first set of bearings between the hub and the spindle and permitting separation of the same and a second set of bearings axially outward of said ring rotatably mounting the hub to the spindle at the outer end of the latter, the first and second sets of bearings being spaced axially to maintain coaxial rotation of the hub with respect to the spindle and balance forces acting on the first and second sets of bearings; and,

a removable cap covering the outer open end of the hub providing ease of accessibility of the sun gear, which can then be removed from the axle shaft and the hub and spindle unit which can then be removed from the axle housing and including means restraining outward axial movement of the axle shaft.

4,091,690
METHOD FOR CONTROLLING CONTINUOUSLY VARIABLE DRIVE RATIO TRANSMISSIONS AND A SYSTEM THEREFOR

Takayuki Miyao, Hiratsuka, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 28, 1976, Ser. No. 727,599
Int. Cl.[2] B60K 17/00, 19/14, 21/00
U.S. Cl. 74—865 4 Claims



3. In a system including a prime mover provided with a fuel supply device for controlling the horse power thereof, a personally operable pedal for controlling said device of the prime mover, and a continuously variable drive ratio transmission adapted to be driven by said prime mover and provided with means for varying the drive ratio between said prime mover and a drive shaft so as to maintain a predetermined relationship between any two of the three factors: the throttle degree, the speed and the output of the prime mover, the improvement comprising in combination

means for detecting the operational condition of said personally operable pedal;

drive control means for controlling the drive ratio of said transmission to retain a first predetermined relationship between the throttle degree and the speed of the prime mover;

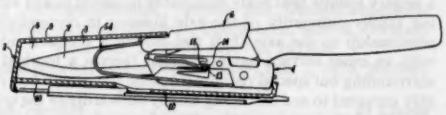
dynamic brake control means for controlling the drive ratio of said transmission to retain a second predetermined relationship between the throttle degree and the speed of the prime mover; and

changeover means for selecting said drive control means, or said dynamic brake control means in response to the operational condition of pedal detected by said detecting means.

4,091,691
KNIFE SHARPENER

Peter Kingsley Bayly, Eltham North, Australia, assignor to Wiltshire Cutlery Company Proprietary Ltd., Melbourne, Australia

Filed Nov. 30, 1976, Ser. No. 746,119
Int. Cl.[2] B21K 11/02; B24B 3/54
U.S. Cl. 76—86 12 Claims



1. A knife sharpener including; a main body, a carrier member pivotally mounted on said main body, a sharpening device attached to a front portion of said carrier member at a position forward of the axis of said pivot mounting and so as to be exposed to an upper side of said carrier member; a reaction

member pivotally mounted on said main body so as to overlie at least part of said carrier member upper side and having front and rear reaction zones located forwardly and rearwardly respectively of said carrier member pivot axis and each being arranged in opposed relationship to said upper side, and the axis of said reaction member pivot being substantially parallel to said carrier member pivot axis and being located rearwardly of said rear reaction zone; and biasing means urging the two said members about their respective pivots so as to resist separation of said front portion and said front reaction zone.

4,091,692

BIT HOLDER

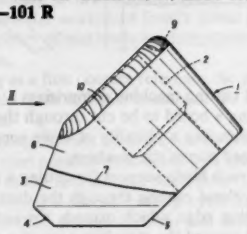
Herwig Wrulich, and Otto Schetina, both of Zeltweg, Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Vienna, Austria

Filed Oct. 18, 1976, Ser. No. 733,407

Claims priority, application Austria, Oct. 29, 1975, 8241/75

Int. Cl.[2] B21K *21/00*; E21C *13/00*

U.S. Cl. 76—101 R **4 Claims**



1. A process for producing a bit holder of the type having a foot portion and a bore for accommodating a bit shaft and which is to be welded to the cutting head of a cutting machine, said process comprising the steps of:

welding a high strength, heat resistant steel blank corresponding to the part accommodating the bit shaft over an entire contacting area to a steel blank corresponding to said foot portion to provide a composite blank and then subsequently forging said composite blank in a forging die to a desired shape.

4,091,693

HELICAL SURFACE-SHAPED MACHINE PART AND METHOD FOR MANUFACTURING THE SAME

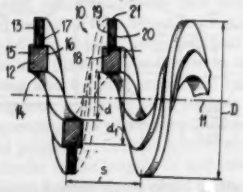
Immanuel Straub, 7323 Wangs, Switzerland

Filed Jun. 25, 1976, Ser. No. 700,060

Claims priority, application Switzerland, Jul. 1975, 8530/75

Int. Cl.[2] B21K *5/02*

U.S. Cl. 76—102 **7 Claims**



1. A method of manufacturing a machine part unsupported by a core and having a flank section extended in radial direction, comprising the steps of: winding and thereby cold working a first metallic component formed of one piece in a substantially helical-configuration through a first diameter into a plurality of coils, winding and thereby cold working a second metallic component formed of one piece through a diameter approximately corresponding to the diameter of the jacket surface of the first wound component and with the same pitch and into a plurality of coils, and introducing the first wound metallic component into the second wound metallic component.

4,091,694

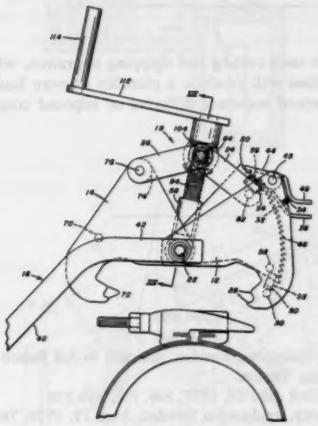
REPAIR CLAMP APPLICATION TOOL

Thomas D. Parrish, Flushing, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jul. 18, 1977, Ser. No. 816,229

Int. Cl.[2] B25B *27/10*; B66F *3/08*; B23P *19/04*

U.S. Cl. 81—9.3 **8 Claims**



1. A tool for pulling together opposed flanges comprising first and second pairs of parallel jaws pivotally mounted for rotation about a transverse axle, said jaws having means for engaging said flanges, a pair of parallel ratchet plates also mounted for rotation about said axle, handle means fixed to said first pair of jaws, linkage means connecting respective ratchet plates and second jaws, a pawl pivotally mounted on said first pair of jaws for engaging the teeth of said ratchet plates, and screw means mounted on said axle and connected to said linkage means to pivotally advance and retract said ratchet plates with respect to said second pair of jaws.

4,091,695

WIRE PREPARATION MACHINE WITH VARIABLE INSULATION STRIPPING MECHANISM

Jack F. Funcik, Downers Grove; Joseph C. Bennett, Lisle, both of Ill., and Vito A. Fusco, deceased, late of Palos Hills, Ill. (by Mary Fusco, legal representative, by Janet Fusco, heir, by Michael Fusco, heir), assignors to Molex Incorporated, Lisle, Ill.

Filed Feb. 28, 1977, Ser. No. 772,534

Int. Cl.[2] H02G *1/12*

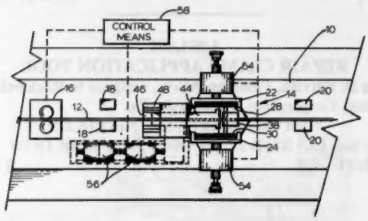
U.S. Cl. 81—9.51 **2 Claims**

1. In a wire preparation machine for fabricating a continuous length of insulation clad wire into a plurality of cut and stripped wire leads including a preparation station, a cutting mechanism at the preparation station for cutting the wire, a stripping mechanism at the preparation station spaced a given distance from the cutting mechanism for stripping insulation from the wire lead exposing a given length of conductor from the end of the wire lead, and intermittent wire drive means for moving the wire to the preparation station after each cutting and stripping operation, the improvement comprising:

stripper mounting means for mounting the stripping mecha-

nism for movement relative to the cutting mechanism so as to vary the distance therebetween; and

control means for programming the distance the stripper mounting means is allowed to move the cutting mechanism after each cutting and stripping operation, whereby said machine will produce a plurality of wire leads in a predetermined sequence different of exposed conductor lengths.

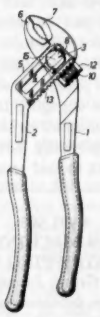


4,091,696

PLIERS

Ulf Wahlberg, Enkoping, Sweden, assignor to AB Bahco Verktyg, Enkoping, Sweden

Filed Jun. 27, 1977, Ser. No. 810,270
Claims priority, application Sweden, Aug. 11, 1976, 7608991
Int. Cl.² B25B *7/04*
U.S. Cl. 81—396 **1 Claim**



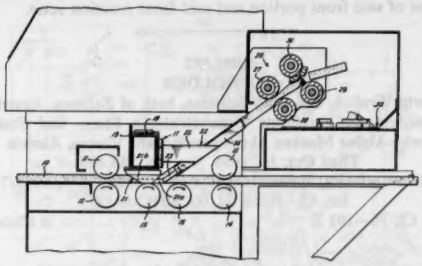
1. A pair of sliding joint pliers with a fulcrum pin (3), projecting from one of the limbs (1) of the pliers, and displaceably arranged in a slot (4) in the second limb (2) of the pliers for adjusting the grip of the pliers, there being an adjusting screw (10) rotatably mounted in a carrying means (12), e.g. a plate, said carrying means being mounted round the fulcrum pin (3) and preferably placed between both limbs (1,2), a rack (13) being arranged along an edge of the said second limb (2), adjacent to the slot (4) and parallel to its longitudinal axis and adapted for coaction with the adjusting screw (10) so that the fulcrum pin (3) can be set in a desired position in the slot (4) by manual actuation of the adjusting screw (10), characterized in that the carrying means (12) is non-rotatably arranged on the fulcrum pin (3) and together with the second limb (2) and fulcrum pin (3) is pivotable in relation to the said first limb (1).

4,091,697

SCRAP STRIPPER AND CHOPPER WITH CONVEYOR

Ronald J. Cailey, San Antonio, Tex., assignor to Glass Master Sales and Leasing Corporation, San Antonio, Tex.

Division of Ser. No. 523,156, Dec. 9, 1974, Pat. No. 3,996,824.
This application Oct. 22, 1976, Ser. No. 735,080
Int. Cl.² B26D *3/06, 9/00*
U.S. Cl. 83—5 **6 Claims**



1. A duct board cutting machine comprising,

means for moving a board to be cut through the machine,

cutting means including a plurality of blade supports selectively positioned across the machine,

blade means on each blade support for cutting a strip from a duct board without cutting through the duct board and having a cutting edge which extends toward the board being cut and toward the strip being cut at a slight angle to a plane normal to the board, causing similarly angled cuts and cutting said strip free from the duct board,

extractor means carried by each blade support lifting the cut strip from the board as it is being cut,

at least one of the extractor means includes a deflector section carried by a blade means and a chute section carried directly by a blade support, and

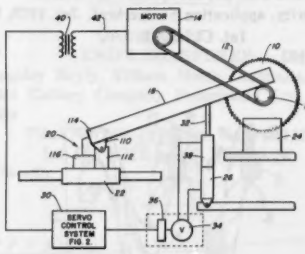
means chopping the strips into short sections.

4,091,698

ROTARY CUTTING BLADE CONTROL SYSTEM

Robert F. Obear, Rolling Hills Estates, and Bruno A. Rist, Northridge, both of Calif., assignors to Western Gear Corporation, Everett, Wash.

Filed Sep. 8, 1975, Ser. No. 611,098
Int. Cl.² B26D *1/28, 7/26*
U.S. Cl. 83—34 **12 Claims**



1. A rotary cutting blade servo control system comprising:

rotary drive means for rotating the cutting blade,

means for positioning the blade during a cut between a home position spaced from a surface of a workpiece, to a through-cut position, and back to a start position close to the surface of said workpiece,

control means controlling said positioning means, said control means including automatic return means returning said blade direct to said start position after a cut has been

completed without going through the home position, said automatic return means including position reference means for producing a position reference indicative of the position of the center of said blade,

sample and hold means for recording as a contact reference the position reference produced at initial contact of the blade with the workpiece during each cut,

sensing means generating a halt command when said blade is returning from a through-cut position and said position reference has a predetermined relation to said contact reference, and

switch means for stopping the blade positioning means responsive to said halt signal from the sensing means thereby automatically positioning the blade at a subsequent start position close to a workpiece for the start of a new cut.

11. A method of making successive cuts through a workpiece with a rotary blade, having a periphery which wears during use comprising:

commencing a first cutting cycle by moving said blade toward the workpiece from a home position wherein the periphery of said blade is relatively remote from the workpiece,

sensing as a first contact reference the position of the center of said blade at initial contact of the blade with the workpiece,

completing the first cutting cycle by returning the blade to a first start position established by a predetermined relationship to the first contact reference,

commencing a second cutting cycle by moving said blade toward the workpiece from said first start position,

sensing as a second contact reference the position of the center of said blade at initial contact of the blade with the workpiece, and

completing the second cutting cycle by returning the blade to a second start position established by a predetermined relationship to the second contact reference whereby the second start position is closer to the workpiece than the first start position to thereby compensate for wear of said blade during the first cutting cycle.

4,091,699

METHOD AND DEVICE FOR CUTTING A BUNDLE OF TUBES

Gilbert Chazé, Bourg-la-Reine; Guy Cherel, Le Vesinet; Rene Guilloteau, Verrieres-le-Buisson, and Daniel Tucoulat, La Frette sur Seine, all of France, assignors to Saint-Gobain Techniques Nouvelles, Courbevoie and Commissariat a l'Energie Atomique, Paris, both of, France

Filed Sep. 8, 1976, Ser. No. 721,442

Claims priority, application France, Sep. 11, 1975, 75 27897

Int. Cl.[2] B26D *4/50, 7/06*

U.S. Cl. 83—56 **15 Claims**

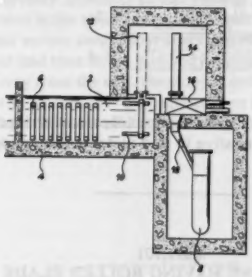
1. A method of cutting a bundle of tubes comprising the steps of inserting a bundle of tubes into a guide tube, said tubes being in parallel relationship with each other, clamping said bundle inside said guide tube by means of at least two movable clamps each of said clamps subjecting said bundle to a controlled thrust in a plane perpendicular to the lengths of said tubes, adjusting said thrust wherein said tubes in said bundle become contiguous with each other without their longitudinal curvature exceeding a predetermined value, moving a blade from an inital position to cut said bundle along a plane generally perpendicular to the lengths of said tubes, retracting said blade to said initial position, moving a safety plate adjacent the cut end of said bundle, withdrawing said clamps a first time by a limited amount, said tubes remaining in contact with said clamps, pushing said bundle toward said blade in a direction parallel to the length of said tubes and, moving said bundle into a cutting path of said blade.

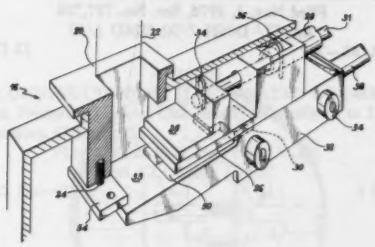
9. A device for cutting a bundle of tubes comprising:

a stationary frame, a removable guide tube and means for vertically moving a bundle of tubes inside said removable guide tube, said guide tube being secured to said stationary frame during operation:

two parallel side clamps and means for moving said side clamps in a direction perpendicular to the lengths of said tubes;

a stationary blade secured to said frame, said blade being adjacent an end of said guide tube nearest an end of said bundle to be cut and substantially opposite one of said side clamps which is nearer an end of said bundle to be cut;





a cutting blade movable from an initial position and coacting with said stationary blade and means for moving said cutting blade wherein a leading edge of said cutting blade moves substantially in a plane corresponding to an edge of said coacting blade remote from said guide tube; and

a movable safety plate and means for disposing it opposite the end of said bundle to be cut in a position substantially parallel to said blades and at a distance from the end of said bundle to be cut greater than the distance which said bundle moves forward between sequential cutting operations, when said cutting blade is in said initial position.

4,091,700

PRESS-HEAD

Jean Cloup, 33360 Latresne, France

Filed Feb. 2, 1977, Ser. No. 764,961

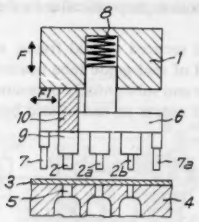
Claims priority, application France, Feb. 2, 1976, 76 02774

Int. Cl.[2] B26F *1/04;* **B26D** *7/06*

U.S. Cl. 83—140 **5 Claims**

1. A reciprocally movable press-head comprising a plurality of punches and mutual stripping members, said stripping members functioning as strippers, with one of said punches functioning as a metal cutting punch and at least one other of said

punches functioning as a stripper, said metal cutting punch being positioned between two strippers with at least one of said



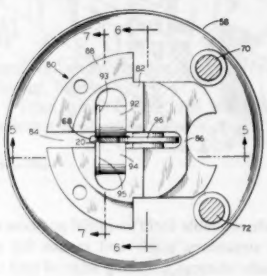
strippers being one of said other punches, said strippers being elastically mounted relative to said metal cutting punch.

4,091,701

CUTTING MACHINE HAVING ROLLER BLADE GUIDE

David R. Pearl, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., South Windsor, Conn.

Filed Nov. 1, 1976, Ser. No. 737,736
Int. Cl.[2] D06H 7/00; B26D 1/10
U.S. Cl. 83—747 **16 Claims**



1. In combination in a cutting machine having a support surface on which sheet material is positioned during a cutting operation, a thin, elongated cutting blade having a sharp leading cutting edge, a straight trailing edge and two broad sides between the leading and trailing edges, and a foot positioned immediately above the sheet material and through which the elongated cutting blade moves and extends into the sheet material during a cutting operation, the improvement comprising:

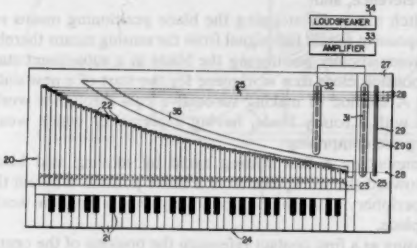
a blade guide mounted in the foot for guiding blade movement during cutting including a first contoured side roller disposed in the guide adjacent one of the broad sides of the blade, a second contoured side roller disposed adjacent the other of the broad sides of the blade, and a back roller adjacent the trailing edge of the blade, the first and second contoured side rollers having parallel axes of rotation and being spaced to guide the blade as the blade moves therebetween, the back roller having an axis of rotation extending transverse to the blade and perpendicular to the parallel axes of the side rollers, the first, second and back rollers all being mounted in the foot on pinions for free rotation in the foot against the blade, the contoured side rollers having raised ridges at axial stations adjacent the leading edge of the blade, the ridges being contoured to generally match the shape of the blade at the leading edge for holding the blade in a blade slot formed by the side and back rollers.

4,091,702

STRING MUSICAL INSTRUMENT HAVING A KEYBOARD

Kazuo Murakami, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Aug. 3, 1976, Ser. No. 711,155
Claims priority, application Japan, Aug. 11, 1975, 50-97350; Feb. 23, 1976, 51-20283[U]; Feb. 23, 1976, 51-20284[U]
Int. Cl.[2] G10H 3/00
U.S. Cl. 84—1.16 **15 Claims**



1. A keyboard musical instrument comprising:

a plurality of juxtaposed key units, each provided with a playing key at one end; p1 a plurality of juxtaposed strings, each string having an effective length to produce a musical tone at a prescribed frequency, one end of each of said strings being directly and fixedly connected to the other end of a corresponding one of said key units and the other end thereof being immovably fixed to the body of said musical instrument;

damping means which is pressed against said strings when the corresponding key units are not operated, thereby suppressing the vibration of said strings; and

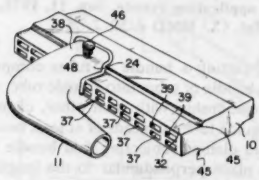
pickup means disposed close to each string at right angles thereto so as to electrically detect the vibrations of said each string produced upon operation of the corresponding one of said key units.

4,091,703

HARMONICA HORN

John P. Adamitis, Meadville, Pa., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Oct. 4, 1976, Ser. No. 729,590
Int. Cl.[2] G10D 9/00
U.S. Cl. 84—378 **2 Claims**



1. A harmonica fitted with a hollow shaped horn that extends about the outlet opening of one or more reed chambers of the harmonica, in which the horn is slidably mounted to the harmonica so as to slidable in use, with said horn formed of a first generally circular hollow section that fits about the harmonica with a first chamber in said first section extending to a second chamber in a second hollow section, which second chamber extends to an outlet opening of the second chamber in the second section, said second section being in the shape of a hollow tube, and with the said second chamber open at the free end of said second section, in which

the said first chamber is of generally circular cross-section that decreases in size along a first axis extending from the juncture of the first section to the harmonica, and the second chamber is of generally circular cross-section that decreases in size along a second axis extending from the juncture of the second section, to the outlet opening of the second chamber, with

said first and second axes being generally perpendicular to each other.

4,091,704

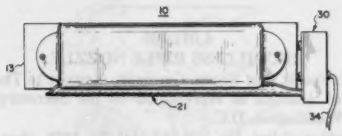
SOUND CHAMBER AND TRANSDUCER APPARATUS FOR USE WITH HARMONICA

LeRoy Howard Moe, 4 Woodland Ct., Lombard, Ill. 60148

Filed Jan. 26, 1977, Ser. No. 762,625

Int. Cl.[2] G10D *7/12*

U.S. Cl. 84—378 **4 Claims**



1. A sound chamber and transducer apparatus for use with a reed-type harmonica having metal plates extending respectively above and below the harmonica body, comprising:

a chamber member of substantially the same length as the harmonica body, having a convex central portion and a pair of outer edge portions formed for engaging the metal plates of the harmonica, and an attaching portion at one end of the chamber member extending at substantially right angles to the chamber member;

a transducer assembly, including a body portion affixed to the attaching portion of the chamber member, and a transducer element supported within the body portion; and

a generally cylindrical sound input director element, having a tapered portion at one extremity open to the space between the sound chamber convex central portion and the harmonica body, and having the other end portion adjacent the transducer element, to conduct the sound vibrations from the chamber to the transducer element.

4,091,705

MUSICAL HORN CONSTRUCTION

Mark S. Veneklasen, 12338 Montana Ave., Apt. 11, Los Angeles, Calif. 90049

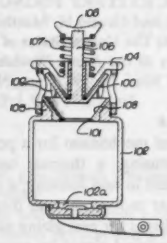
Division of Ser. No. 412,334, Nov. 2, 1973, Pat. No. 3,933,078.

This application Jan. 12, 1976, Ser. No. 648,172

The portion of the term of this patent subsequent to Jun. 7, 1994, has been disclaimed.

Int. Cl.[2] G10D *9/04*

U.S. Cl. 84—385 P **2 Claims**



1. A horn having tubing defining a generally rectangular bore with a flat interior side defining a side opening, there being a valve stopper plugging said side opening with the inner end of the stopper proximate the tubing bore, and means mounting the stopper and guiding a stem defined by the stopper for linear movement toward and away from the side opening, the stopper having a flat end surface which is flush with said flat interior side when the stopper plugs said side opening, the valve stopper being tapered and movable toward and away from a tapered seat which flares away from said side opening, the stopper end surface remaining surrounded by said seat during said linear movement, said means including a tubular body removably attached to the tubing, said body defining multiple tone holes spaced about said stem to be uncovered as the stopper moves away from said tapered seat, said seat flaring toward said tone holes, said body limiting movement of the stopper away from the seat, the stopper and seat having matching tapers so located that the gap between the stopper and seat always flares toward said tone holes as the stopper moves relative to the seat.

4,091,706

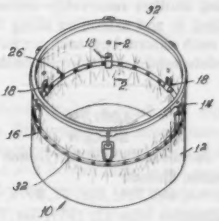
CONSTRUCTION OF ILLUMINATED DRUMS

William Frederick Ludwig, Oak Brook, Ill., assignor to Ludwig Industries, Chicago, Ill.

Filed Oct. 6, 1976, Ser. No. 730,184

Int. Cl.[2] G10D *13/02*

U.S. Cl. 84—411 R **4 Claims**



1. An illuminated drum for use as a percussion musical instrument comprising

a shell formed, at least in part, of transparent material,

said shell being of generally cylindrical shape to form a chamber with openings at both ends thereof,

a drum head covering at least one end of the shell,

means for securing said drum head to the shell,

said securing means including lugs spaced around the shell externally thereof and also including a drum ring for retaining said head, which ring is attached to the shell by said lugs,

an electrical light source,

a tube of electrically insulating material in which said light source is contained,

means for securing said tube internally of the shell

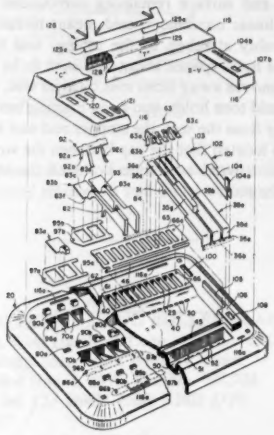
and a source of electricity for energizing said light source,

said means for securing said tube to said shell comprising a series of brackets on the inside of the shell contacting said tube and means extending through the shell for securing the brackets on the inside thereof to the lugs on the outside thereof with the shell and the tube therebetween.

4,091,707
COMPACT CHORD ORGAN

Harold B. Martin, West Caldwell, and Herman O. Rogg, Watchung, both of N.J., assignors to Graber-Rogg, Inc., Cranford, N.J.

Filed Dec. 22, 1975, Ser. No. 642,720
Int. Cl.[2] G10C 3/12
U.S. Cl. 84—423 4 Claims



1. In the manufacture of a musical keyboard which comprises:

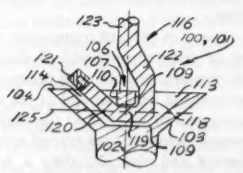
a plurality of natural and sharp-flat keys molded in a predetermined spacial relationship with respect to each other, and

one removably connected runner integrally molded to and extending along the pallet end of each natural and sharp-flat key, and another removably connected runner integrally molded to and extending along the finger depressing end of each natural key, said runners holding the keys in said predetermined spacial relationship.

4,091,708
SCREW

Ralph Spencer Jacobson, 27970 Le Dunne Ave., Aldergrove, British Columbia, Canada

Division of Ser. No. 680,715, Apr. 27, 1976, Pat. No. 4,033,244.
This application May 12, 1977, Ser. No. 796,347
Int. Cl.[2] F16B 23/00
U.S. Cl. 85—45 10 Claims



1. A screw for use with a screw driver; the screw driver having a shank and a generally V-shaped screw engaging means at an end of the shank, the screw engaging means having an inclined end portion, a root portion, a transverse portion and an oblique portion, the root portion extending from the inclined end portion so as to be displaced transversely from the shank, the transverse portion interconnecting the root and the oblique portions, and the oblique portion extending obliquely from the transverse portion so as to define the generally V-shaped screw engaging means; the screw having a threaded body and a screw head disposed on a central axis of the screw, the screw head having an outer surface, and a driver engaging means characterized by:

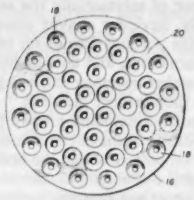
(a) a bridge portion adjacent the outer surface of the screw head remote from the body, the bridge portion having a bridge axis coincident with a diameter of the screw head and bridge inner and outer side walls spaced on opposite sides of the diameter by an amount sufficient to permit the screw engaging means of the screw driver to be retained in the screw with the shank of the screw driver aligned with the central axis of the screw,

(b) a clearance passage extending under the bridge portion to accept the V-shaped screw engaging means, the passage having clearance at inner and outer ends thereof for insertion and removal of the V-shaped engaging means, the passage having a pair of oppositely facing passage side walls extending in spaced planes between portions of the clearance passage on opposide sides of the bridge portion so that each side wall extends generally smoothly under the bridge portion.

4,091,709
RECOILLESS RIFLE NOZZLE

Joseph H. Spurk, Bad König, Germany, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 708,967, Jul. 26, 1976, abandoned.
This application Aug. 15, 1977, Ser. No. 824,672
Int. Cl.[2] F41F 3/02
U.S. Cl. 89—1.703 4 Claims



3. A method of reducing the penetration depth of the disturbed gas field extending from a single large venturi shaped nozzle for producing a predetermined amount of recoil reduction mounted in the exit port of a recoilless type gun, without significantly sacrificing the recoil characteristics thereof, which comprises replacing said single large venturi shaped nozzle with a plate mounted in said exit port, which contains a plurality of small venturi shaped nozzles possessing the same ratio of throat area to exit area as said single nozzle, the sum of the exit areas of said plurality of small nozzles being approximately equal to the exit area of said single large nozzle.

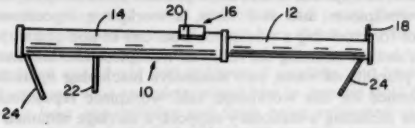
4,091,710
THERMAL BATTERY FIRING MECHANISM

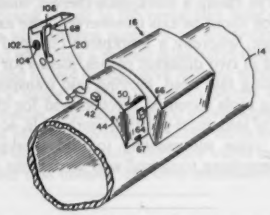
Jeffrey A. Lienau, and Gerald H. Matthews, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 18, 1977, Ser. No. 779,220
Int. Cl.[2] F41F 3/04
U.S. Cl. 89—1.814 9 Claims

1. A fire control mechanism for a portable rocket launcher comprising: a housing; a thermal battery with percussion means and mounted in said housing; a spring biased firing pin mounted for linear movement and disposed for impact with said percussion means for energizing said thermal battery and generating an electrical signal to cause ignition of a rocket carried in said launcher; actuating firing mechanism disposed for effecting displacement of said firing pin for impact thereof with said percussion means, said actuating firing mechanism comprising: a firing button slidably mounted in said housing,

said firing button having first and second ends, said first end being provided with means for cooperating with a latch pin on said firing pin until said firing button has been slid to a position which releases said latch pin for actuation of said firing pin, said second end of said firing button being disposed for slidably moving said firing button when it is desired to fire the rocket, said firing button having two spaced grooves therein intermediate said first and second ends; a safety slidably mounted in said housing and having means thereon which cooperates with one of said two spaced grooves to prevent actuation of said firing button until said safety has been moved to a safety firing position; and an interlock button mounted in said housing and cooperating with the other of said two grooves for preventing movement of said firing button until said interlock button has been actuated out of said other groove.



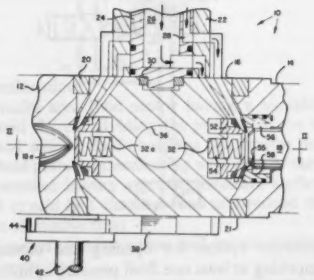


4,091,711

ROTARY BOLT LIQUID PROPELLANT GUN

Gary L. Petersen, and John W. Holtrop, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 26, 1977, Ser. No. 800,751
Int. Cl.[2] F41F *1/04*
U.S. Cl. 89—7 **6 Claims**



1. A liquid propellant gun breech loading, injection and firing mechanism comprising;

a liquid propellant gun body including a rearward loading portion, a forward barrel portion and a rotatable breech block intermediate said rearward and forward portion;

said gun body having oppositely facing contoured portions between said rearward and forward portion;

said rotatable breech block mechanism comprising contoured surfaces complimentary to said contoured surfaces on said rearward loading and forward barrel portions so that said breech block may be closely confined between said contoured surfaces for rotary motion around an axis perpendicular to the axis of said barrel portion;

said breech block further comprising a fuel transfer housing having a cylindrical inner bore coaxial with said rotational axis for receiving therein a fuel transfer tube;

said breech block further comprising a central bore, at least one injection valve mechanism and at least one firing device each having an axis of symmetry within a plane passing through the barrel axis and perpendicular to the axis of said fuel transfer housing; and

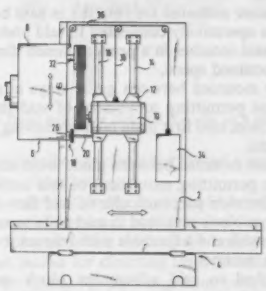
means for incrementally moving said breech block to serially position said bore, said injection valve mechanism and said firing mechanism respectively in line and register with said barrel.

4,091,712

SPINDLEHEAD WITH SPINDLE DRIVING MOTOR

Michael Geiger, Munich, Germany, assignor to Friedrich Deckel Aktiengesellschaft, Munich, Germany

Filed Apr. 14, 1976, Ser. No. 676,643
Claims priority, application Germany, May 14, 1975, 2521447
Int. Cl.[2] B23B *47/26*
U.S. Cl. 90—11 F **8 Claims**



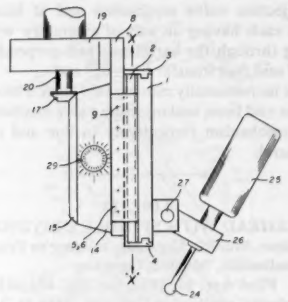
1. In a tool machine having a headstock with a rotatable input shaft thereon, first guideway means, means supporting said headstock for movement along said first guideway means on said tool machine and further including a second guideway means, a spindle driving motor and means supporting said driving motor for movement with said headstock along said second guideway means parallel to and separate from said first guideway means and drive means for drivingly coupling said spindle driving motor to said rotatable input shaft, at least one of said spindle driving motor and said headstock being drivable along the respective one of said first and second guideway means, the improvement comprising releasable carrier connection means for positively directly and releasably connecting said spindle driving motor to said headstock to effect a direct and positive transmission of driving force from said one of said spindle driving motor and said headstock to the other thereof and in a direction parallel to said first and second guideway means, said releasable carrier connection means including a jointed connection which transmits forces only in a direction parallel to said guideway means, said jointed connection including a fingerlike member mounted on one of said spindle driving motor and said headstock and a bifurcated piece mounted on the other of said spindle driving motor and said headstock, said fingerlike member being received between the legs of said bifurcated piece, said two legs of said bifurcated piece each having setscrews thereon having approximately semispherical free ends, said setscrews each being screwed against opposite sides of said fingerlike member, which sides face in the direction of movement of said spindle driving motor and said headstock.

4,091,713

RADIUS MILLING OR GRINDING TOOL ACTUATOR OR CONTROLLER

Henry J. Kennedy, 2029 Frederick St., Beloit, Wis. 53511

Filed Dec. 17, 1976, Ser. No. 751,271
Int. Cl.² B23C 3/00; B24B 7/00
U.S. Cl. 90—15 A **3 Claims**



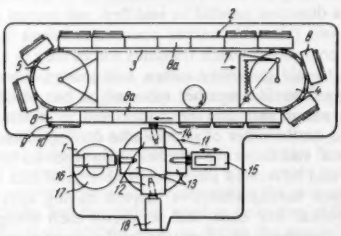
1. A toolholding apparatus comprising:
a base frame,
a plate member mounted for rotation in said base frame,
drive means operatively connected to said plate member for rotating said member in a predetermined direction and at a predetermined speed,
a first plate mounted between guide ways attached to said base frame permitting movement of said first plate in a first direction, said first plate member having an elongated slot therein,
a second plate mounted between guide ways attached to said first plate permitting movement of said second plate in a second direction perpendicular to said first direction,
an adjustment block mounted in said plate member for rotation therewith and adjustable with respect to the center of said plate member,
a pin attached to said adjustment block and extending through said elongated slot in said first plate member and through said second plate member, whereby said second plate member traverses a circular path, and a power driven cutting tool attached to said second plate by means of a pivoted arm.

4,091,714

BROACHING MACHINE

Anatoly Ivanovich Kostousov, Kholzunov pereulok, 10, kv. 16; Valentin Vasilievich Ionov, Korobeinikov pereulok, 5, kv. 7; Vyacheslav Georgievich Shakhbazyan, ulitsa Festivalnaya, 44, kv. 26, and Vladimir Afanasievich Terekhin, ulitsa Vishnevskogo, 8, kv. 61, all of Moscow, U.S.S.R.

Filed Dec. 7, 1976, Ser. No. 748,374
Int. Cl.² B23D 37/18, 41/06
U.S. Cl. 90—76 **6 Claims**



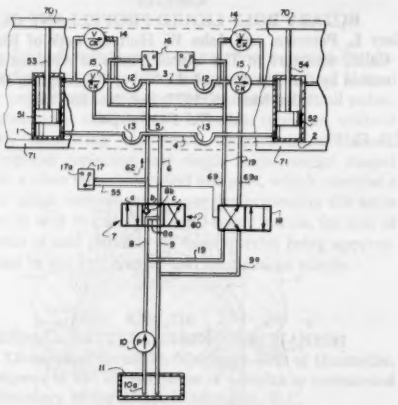
1. A continuous-action broaching machine for machining the external surfaces of workpieces, comprising: a framework; a multi-position rotatable work table supported by said framework; a plurality of vices adapted to clamp workpieces therein, mounted on said work table defining the multi-positions thereof; a transport means mounted adjacent to said multi-position work table; a plurality of broaching tools mounted on said transport means to be continuously carried past said multi-position work table; a workpiece loading means mounted on said framework adjacent to said multi-position work table for loading workpieces into said vices; a workpiece repositioning means for receiving a workpiece from one of said plurality of vices and for inserting the received workpiece into another of said plurality of vices, two successive machining operations performed on this workpiece; said workpiece repositioning means including a stationary support, a carriage mounted on said stationary support for rotation with respect thereto, first guideway means defined by said carriage, a rest mounted on said carriage for movement in said first guideway means, a head adapted to clamp a workpiece therein, mounted on said rest for rotation about an axis transverse to the axis of rotation of said carriage, whereby a workpiece clamped in said head can be rotated in two different planes, means for rotating said carriage, rotating said head, moving said transport means and said broaching tools mounted thereon, and for effecting stepwise rotation of said multi-position work table, so as to present each of said vices successively to said workpiece loading means, said broaching tools and said workpiece repositioning means.

4,091,715

HYDRAULIC SYSTEM FOR OPENING AND CLOSING HOPPER BARGES

Georg Onderka, Metten, Germany, assignor to Deggendorfer Werft und Eisenbau G.m.b.H., Germany

Filed May 6, 1976, Ser. No. 683,761
Claims priority, application Germany, May 30, 1975, 2523823
Int. Cl.² F01B 25/26
U.S. Cl. 91—1 **4 Claims**



1. A hydraulic system for opening and closing hopper barges, comprising at least one fluid pressure cylinder adapted to be positioned on one of the barge parts, a piston slidable in said cylinder and having a rod extending through an end of said cylinder and adapted to be connected to the other barge part, a first conduit having a hose coupling section capable of developing leaks and being connected to said cylinder adjacent the end through which said rod extends; a second conduit having a hose coupling section capable of developing leaks, and being connected to said cylinder adjacent the end opposite the end through which said piston rod extends; a pump having a discharge connectable to said first and second conduits; a

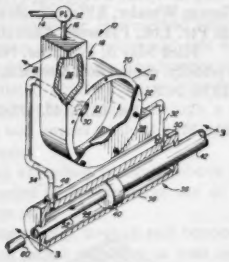
return line connectable to said first and second conduits; a first pilot valve connected into said first and second conduits between said pump and the fluid pressure cylinder, and between said return line and the fluid pressure cylinder respectively; said first pilot valve having a first position communicating said pump discharge to said first conduit, and communicating said second conduit to said return line; a second position, said second position having a non-return valve and communicating said first conduit to said non-return valve, and communicating said pump discharge to said return line; and a third position communicating said second conduit to said pump discharge, and said first conduit to said return line; check valve locking means connected to at least one end of said cylinder and to the associated one of said first and second conduits, and having a valve seated with a predetermined bias to prevent fluid from said at least one cylinder end from being exhausted to the associated one of said first and second conduits to maintain a closing pressure on said cylinder and sensing means connected to said first conduit for sensing any pressure drop in said first conduit when said first pilot valve is in its second position whereby to detect a leak in the respective hose coupling section; wherein said sensing means is an electrohydraulic pressure valve and including a second pilot valve connected to said first conduit and to said check valve locking means for unloading said check valve locking means to permit sliding movement of said piston, said second pilot valve being further connected to said electrohydraulic pressure valve and being activated by said electrohydraulic pressure valve only when the pressure in said first conduit has been maintained.

4,091,716

FLUIDIC SERVO-SYSTEM AND METHOD

William Francis Ryan, Phoenix, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Oct. 18, 1976, Ser. No. 733,566
Int. Cl.² F15B *9/10, 15/17*
U.S. Cl. 91—49 **11 Claims**



1. In combination:

a differential area fluid motor having a movable member mounted therein dividing the interior of the motor into first and second fluid chambers, said motor having separate fluid ports communicating with each of the chambers, said member having a greater effective surface area exposed to said first chamber than said second chamber;

a source of motive fluid

conduit means communicating said source with both of said fluid ports; and

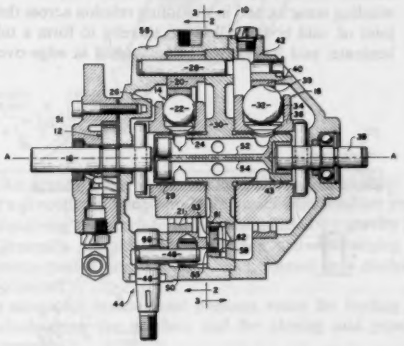
fluidic means having no moving parts interposed in said conduit means whereby motive fluid flow passes through said fluidic means to both of said fluid ports, said fluidic means operable to permit flow of motive fluid at a relatively high flow rate from said source to said first chamber during movement of said member in a first direction, and for reducing the rate of fluid flow to said first chamber to a relatively low level during movement of said member in a second, opposite direction, said fluidic means being operably interconnected with said motor to produce said high and low flow rates to said first chamber respectively in response to egress and ingress of fluid flow through said port communicating with said second chamber.

4,091,717

RING DAMPENER FOR ROTARY FLUID PRESSURE DEVICE

Edward J. Bojas, and David C. Ours, both of Marshall, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 597,058, Jul. 18, 1975, abandoned. This application Apr. 28, 1976, Ser. No. 680,991
Int. Cl.² F01B *13/06;* **F16D** *31/02*
U.S. Cl. 91—498 **9 Claims**



1. A rotary fluid pressure device for use as a pump or motor comprising:

A. a housing member having a cavity and a pair of confronting axially spaced surfaces;

B. a rotor located within the cavity and having a plurality of circumferentially spaced, radially extending bores;

C. a piston located within each of the bores;

D. inlet port means for directing fluid to certain bores;

E. outlet port means for directing fluid from certain bores;

F. means supporting the rotor relative to the housing member for rotation about an axis;

G. a movable annular ring member disposed between the surfaces, encircling the rotor and engaged with the pistons; and

H. means for reducing the vibration of the ring member during rotation of the rotor by moving the ring member away from one of the surfaces into engagement with the other surface, said means including

(1) a shoe supported by one of the members for axial movement into engagement with the other member, and

(2) means for exerting a force on the shoe in an axial direction to move the shoe into engagement with the other member, the magnitude of the exerted force on the shoe being proportional to the magnitude of the pressure of the fluid within certain of the bores.

4,091,718

METHOD AND APPARATUS FOR FORMING COMPOSITE CONTAINER INCLUDING A TAB-CUT LABEL LAYER

Dewey B. Thornhill, St. Charles, Mo., assignor to Boise Cascade Corporation, Boise, Id.

Filed Jan. 18, 1977, Ser. No. 759,336
Int. Cl.² B31C *1/06*
U.S. Cl. 93—39.1 R **14 Claims**

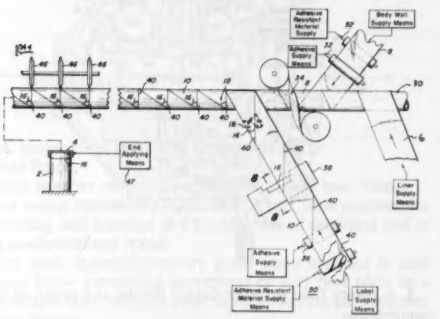
1. The method of manufacturing a composite container for dough products and the like, comprising the steps of

(a) helically winding on a mandrel an impervious inner liner layer strip (6);

(b) helically winding a fibrous body wall layer strip (8) in the same sense as, and in adhesively bonded relation on the external surface of, said helically-wound inner liner layer, said body wall layer having a helical unbonded butt joint (12) the adjacent edges of which are contiguous, said liner layer including a helically extending folded expansible portion (6a, 6b) bonded to said body wall layer on both sides of, and extending solely in straddling relation across the inner surface of, said body wall helical butt joint;

(c) cutting in one longitudial edge of a label layer strip 10) a plurality of longitudinally-spaced parallel tab cuts (16) angularly arranged relative to the longitudinal axis of said label layer strip;

(d) helically winding the label layer strip in adhesively-bonded relation on the external surface of, in the same winding sense as, and in straddling relation across the butt joint of, said body wall layer, thereby to form a tubular laminate, said label layer being wound in edge-overlapping relation with said one edge portion being exposed and laterally offset from said butt joint;



(e) transversely cutting the tubular laminate along longitudinally spaced lines of circumferential end cuts contained in planes normal to the longitudinal axis of the tubular laminate, thereby to define a plurality of cylindrical laminate sections, said label layer strip being wound with each of said tab cuts arranged in laterally spaced relation relative to the associated butt joint and extending toward said end cut at an acute angle (α) relative to said end cut, whereby a pull tab portion (18) is defined in said label layer between the tab cut and the label layer edge; and

(f) securing to the end of the laminate section adjacent the tab cut a metal end closure member, whereby upon pulling of the tab portion of the label defined by the tab cut, the label is torn from the container assembly along a circumferential tear line adjacent the metal end closure member.

4,091,719

WELDING BOOTHS

Vernon W. Galloway, 1932 W. Pearl St., Pasco, Wash. 99301

Filed Mar. 7, 1977, Ser. No. 774,882

Int. Cl.[2] F23J *11/00*

U.S. Cl. 98—33 A **7 Claims**

1. A ventilated multi-compartment welding booth, comprising:

a supporting frame defining a series of welding compartments arranged in an elongated rectangular cluster;

a plurality of side walls transversely oriented to the longitudinal dimension of the frame and defining outwardly facing front entrance to the individual compartments;

a central longitudinal partition wall extending the length of the frame and joined with the side walls thereby enclosing the booths on three sides;

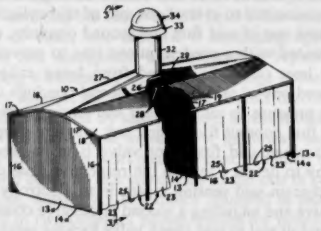
a common roof structure covering the cluster of compartments;

closure means spanning the front entrance of the compartments for selectively closing the front openings;

said closure means having bottom closure edges space elevationally above the ground or floor surface to allow free passage of outside air under the bottom closure edges and into the associated compartments;

a central longitudinal air plenum operatively associated with the booths through the roof structure and leading to a central exhaust stack;

vent screens on the frame openly interconnecting each compartment with the plenum and wherein the screens are joined at lower horizontal edges thereof to the central wall and to the roof structure at upper horizontal edges;



work stations within each compartment adjacent the central wall and elevationally below the associated vent screens; and

blower means associated with the plenum for drawing air through the screens from under the elevated bottom edges of the closure means thereby creating an inward and upward moving air current that passes by the work stations and directly enters the plenum through the screens.

4,091,720

SANDWICH TOASTING APPARATUS

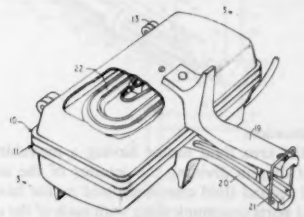
Richard George Wheeler, Killara, Australia, assignor to Breville Holdings Pty. Ltd., Pyrmont, Australia

Filed May 3, 1977, Ser. No. 793,273

Claims priority, application Australia, May 4, 1976, PC5810; Nov. 11, 1976, PC8103

Int. Cl.[2] A47J *37/00*

U.S. Cl. 99—375 **4 Claims**



1. Sandwich toasting apparatus consisting of two mould halves constructed and arranged to be brought together to form between them at least one cavity shaped to receive and compress the peripheral edges of a sandwich consisting of two slices of bread having a filling between them placed in one of said mould halves; electric heating means associated with said mould halves to heat said sandwich and toast the exterior thereof and means to retain said mould halves in a closed position; characterized in that each mould half is provided with at least one transverse rib extending into the mould cavity when said mould halves are brought together, the said ribs each having a flat face positioned so as to be adjacent the flat face of the rib in the other mould half when said moulds are

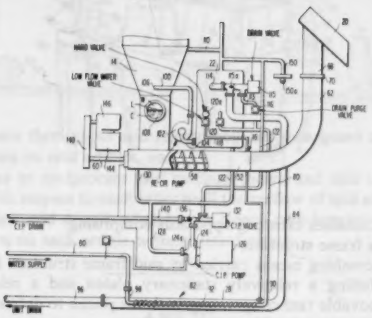
brought together after the manner of the blades of a pair of scissors to sever progressively a sandwich in said toasting apparatus and to seal the severed edges.

4,091,721

PASTA-FILATA CHEESE MIXING AND STRETCHING MACHINE

Vincent Cosmi, Richmond, Vt., assignor to Geraldine Z. DeStafeno, Hagerstown, Md.

Filed Dec. 14, 1976, Ser. No. 750,494
Int. Cl.² A23C *19/02*
U.S. Cl. 99—453 **3 Claims**



1. A pasta-filata cheese curd mixing and stretching machine comprising:

a vertical hopper carrying a mass of water and having an opening at its upper end for receiving cheese curd sections for vertical movement under gravity through the water,

a horizontal discharge duct underlying said hopper and forming an extension thereof,

an auger assembly comprising: intermeshed helical augers mounted for rotation about a horizontal axis within said discharge duct and being open to the hopper interior for receiving accumulated cheese curd and for forcing the cheese curd to move horizontally through a discharge duct surrounding said augers while stretching the cheese curd during transport,

an accumulator duct extending vertically above the auger assembly and coupled to the discharge end of the auger assembly discharge duct,

means for recirculating water through said hopper, said hot water recirculating means including at least one pair of water injection nozzles opening into said hopper from opposite sides at a lower end thereof,

at least one water overflow pipe mounted to said hopper above the level of said water injection nozzles for removing water from said hopper,

a make-up tank receiving the water from said overflow pipe and supplying hot water to said water injection nozzles, a pump coupled to said make-up tank between said make-up tank and said water injection nozzle means,

means for removing a portion of the water from said recirculation circuit and for supplying fresh water thereto,

a drive motor for said augers,

a low speed transmission means coupling said motor to said augers for rotating said augers at relatively low speed, and

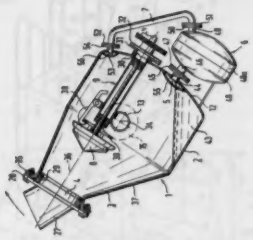
a back pressure plate mounted on the discharge end of said vertical accumulator duct and at a position sufficiently remote from said augers for maintaining a back pressure on the cheese curd accumulating within said vertical accumulator duct to insure complete stretching of said cheese curd and uniform mixing of the same during transport by said augers from said hopper.

4,091,722

APPARATUS FOR STEAM PEELING PRODUCE

Paul Kunz, Deishardtstr. 3, Dottesfeld, Germany (5419)

Filed Apr. 7, 1976, Ser. No. 674,553
Claims priority, application Germany, Apr. 15, 1975, 7511878 [U]
Int. Cl.² A23N *7/00*
U.S. Cl. 99—479 **13 Claims**



1. An apparatus for steam-peeling produce comprising:

(a) a pivotally-mounted pressure vessel, said pressure vessel receiving the produce to be steam-peeled by gravity in a generally upright feeding position and discharging the steam-peeled produce after being rotated to a discharge position;

(b) means for opening said pressure vessel for feeding and discharging the produce and for closing said pressure vessel;

(c) means for providing a bath of water at the bottom interior of said pressure vessel during said generally upright feeding position for receiving fed produce in a relatively impact-free manner;

(d) means for withdrawing at least a portion of the water from said pressure vessel including:

(i) an outlet opening in the region of the water bath; and

(ii) a reservoir connected to said outlet opening; and,

(e) selectable means for returning withdrawn water in said reservoir means to said pressure vessel when said pressure vessel is rotated in the direction of its discharge position.

4,091,723

BINDING APPARATUS FOR PALLETIZED LOADS

Teruaki Izawa, Tokyo, Japan, assignor to Nihon Hoso Kikai K.K., Tokyo, Japan

Filed Dec. 20, 1976, Ser. No. 752,527
Int. Cl.² B65B *57/10*; G05D *15/00*
U.S. Cl. 100—4 **9 Claims**

1. A binding apparatus for tying horizontally around palletized loads comprising:

a tie machine having an arm directed downwards and being rotatable in a radial direction about a pivotal axis above a path of said palletized loads;

a framework support for said tie machine having right and left side surfaces on which front and rear rollers are disposed;

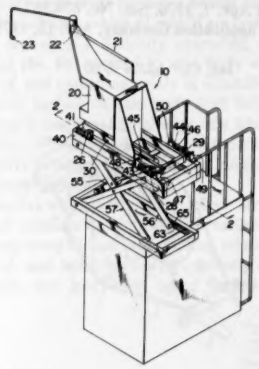
a base having front and rear rails on an upper surface thereof on which said front and rear rollers of said framework supporting said tie machine are rested so as to permit the advancement and retraction of said framework and said tie machine supported thereon on said rails;

L-shaped fittings secured to said upper surface of said base;

said rear rails including guide bars supported by said L-shaped fittings and disposed above said rear rails and extending in parallel relation therewith, to thereby hold said rear rollers of said framework supporting said tie machine between said rear rails and said guide bars;

means for exerting linear reciprocating motion to said framework and said tie machine supported thereon so as to

permit said advancement and retraction thereof horizontally on said base; and



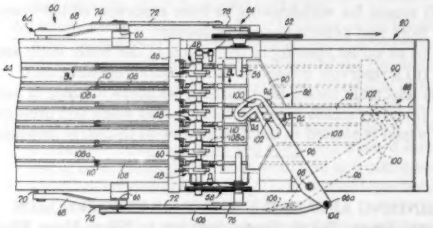
means for exerting vertical motion to said base so as to raise or lower said base.

4,091,724

SLACKENING MECHANISM FOR BALE TIER

Allen Andrew White, Peabody; George Yatcilla, and Garold Lee Fleming, both of Newton, all of Kans., assignors to Hesston Corporation, Hesston, Kans.

Division of Ser. No. 717,521, Aug. 25, 1976. This application Mar. 16, 1977, Ser. No. 778,247
Int. Cl.² B65B *13/05*
U.S. Cl. 100—21 **10 Claims**



1. In a machine wherein a bale is pushed through a chamber and progressively increased in size by the intermittent packing of additional material against the trailing end of the bale:

a knotter operable during each cycle of operation to unite the first and second, opposite strand ends of a binding loop around a finished bale and to retain a first end of a strand to be looped about the next succeeding bale;

apparatus operable during each cycle of operation to present a second and a first strand end to the knotter to complete the loop around the finished bale and to prepare for a loop around the next bale,

said apparatus being further operable during each operating cycle to place the strand across the path of travel of the next bale in position to be engaged by the leading end thereof and to pay out the strand along the bottom of the next bale as the latter progresses through the chamber; and

mechanism for drawing slack in the strand equal to no more than the length of the next bale and prior to commencement of said next bale for depletion by the latter along the top side thereof as the next bale progresses through the chamber and forms a loop in the strand,

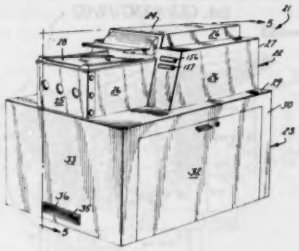
said mechanism including a reciprocable device shiftable forwardly with respect to the path of travel of the bales during each operating cycle of said apparatus for laying the slack on top of the preceding bale.

4,091,725

CONTAINER CRUSHING DEVICE

Ewald A. Arp, 15910 Cedar Ridge Rd., Hopkins, Minn. 55343

Continuation of Ser. No. 612,088, Sep. 10, 1975, abandoned. This application Feb. 9, 1977, Ser. No. 766,946
Int. Cl.² B30B *15/30*
U.S. Cl. 100—45 **16 Claims**



1. Container crushing apparatus comprising:

(a) a frame structure;

(b) crushing means carried by said frame structure and including a relatively stationary platen and a relatively movable ram cooperating with the platen to define therebetween a crushing zone;

(c) container feeding means for feeding containers singly and in succession to said crushing zone;

(d) power operated mechanism for imparting container crushing reciprocatory movements to the ram toward and away from said platen;

(e) a pair of spaced receptacles for crushed containers;

(f) container delivery means underlying the crushing zone and including a magnet for receiving crushed containers from the crushing zone and delivering each crushed container to a predetermined one of said receptacles;

(g) power operated means;

(h) and control means for said power operated means operative to energize said power operated means responsive to feeding of given ones of said containers toward the crushing zone and including:

(i) a pair of container engaging probe members;

(ii) means mounting said probe members in said frame structure for movements toward and away from engagement with opposite ends of a container;

(iii) linkage operatively connected to said power operated mechanism for imparting said movements to the probe members;

(iv) and a selector switch operated by said linkage and disposed in an electrical circuit including said probe members and a container when the container is engaged by said probe members.

4,091,726

MAGNETIC REGISTRATION APPARATUS FOR SILK SCREEN PRINTER

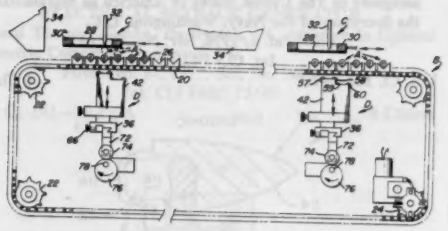
Howard R. Walker, Aldan, Pa., assignor to Joseph E. Podgor, Inc., Pennsauken, N.J.

Filed Nov. 2, 1976, Ser. No. 738,318
Int. Cl.² B41F *17/20*
U.S. Cl. 101—38 A **10 Claims**

1. Apparatus for precisely registering and operating on elongated articles with respect to a silk screen stencil where such articles include a surface symmetrically disposed about the longitudinal axis thereof and a magnetically attractable index contained thereupon, comprising:

carriage means for rotatably supporting said articles with respect to the longitudinal axis, magnetic means secured

to said carriage means for attracting the index and causing rotation of each article until a predetermined portion on the surface thereof is in alignment with a pattern on the silk screen stencil, said magnetic means being positionally located in fixed relation to said carriage means to provide spaced disposition between said magnetic means and said



index throughout said registration and subsequent operations on said articles, and

means to reciprocate said carriage means and said stencil with respect to each other until the surface of said articles abuts said stencil, whereby the stencil may imprint a pattern on each article without interference.

4,091,727

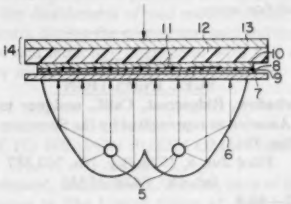
HEAT-SENSITIVE COPYING METHOD FOR PREPARATION OF PRINTING STENCILS

Takanori Hasegawa, and Yoshio Tsuji, both of Tokyo, Japan, assignors to Asahi Dow Limited and Riso Kagaku Corporation, both of Tokyo, Japan

Continuation of Ser. No. 385,246, Aug. 3, 1973, abandoned. This application Jul. 7, 1975, Ser. No. 593,185

Int. Cl.² B41N *1/24;* B41C *1/14*

U.S. Cl. 101—128.2 **8 Claims**



1. Method for producing a printing stencil comprising

(a) positioning a stencil sheet which includes a thin stretched thermoplastic resin film supported on an ink pervious porous substrate, on an original with an imaged side of said original in close contact with said resin film, said original image comprising a substance which absorbs light of a wavelength in the near infra-red range of and above 0.7 micron and which releases heat of absorption at said wavelengths, and

(b) irradiating the resulting assembly formed in (a) with high intensity light having a high radiation intensity for wavelengths of 0.7 micron or more concentrated at 60% or more in terms of quantity of light within the wavelength range of from 0.7 to 1.2 microns, said radiation being effected for a time interval only of from about 10^{-4} to about 10^{-3} second, said radiation being absorbed by said original image to generate absorptive heat thereat, and

(c) producing openings by said absorptive heat in corresponding portions of said resin film which are opposed to said original image.

4,091,728

PORTABLE LABEL PRINTING MACHINE

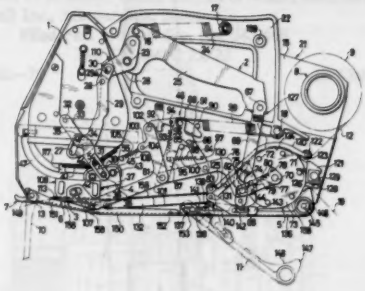
Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Tokyo, Japan

Continuation of Ser. No. 681,251, Apr. 28 1976, abandoned. This application Aug. 8, 1977, Ser. No. 822,813

Claims priority, application Japan, Apr. 28, 1975, 50-050748

Int. Cl.² B41F *1/08*

U.S. Cl. 101—288 **20 Claims**



11. A portable printing machine for printing labels, or the like comprising:

a hand lever supported in said machine; said hand lever being movable from a normal position to an operative position and back again;

a print head held stationary in said machine and carrying types;

a platen movable toward and away from said types; a platen lever carrying said platen; said platen lever being movably mounted in said machine, so that said platen lever is moved to shift said platen toward and away from said types; said platen lever normally shifting said platen away from said types;

a platen lever moving device, comprising:

a pawl; platen lever engaging means on said pawl for selectively engaging with and disengaging from said platen lever;

biasing means connected with said pawl to bias said pawl to move such that when said platen lever engaging means engages said platen lever, said platen lever is moved to shift said platen toward said types;

pawl disengagement means located on said machine and positioned to engage said pawl as said pawl is shifted under the bias of said biasing means; said pawl being so shaped and said pawl disengagement means being so positioned that upon said pawl engaging its said disengaging means, said platen lever engaging means is separated from said platen lever;

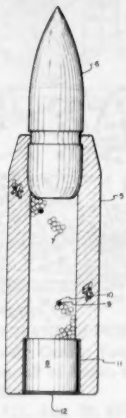
a pawl raising device connected between said pawl and said hand lever such that upon movement of said hand lever to its said operative position, said hand lever causes said pawl raising device to engage and move said pawl against the bias of said biasing means to bring said platen lever engaging means into engagement with said platen lever; means in said machine for disengaging said pawl raising device from said pawl after said platen lever engagement means engages said platen lever.

4,091,729

LOW VULNERABILITY BOOSTER CHARGE CASELESS AMMUNITION

Frank H. Bell, Brigham City; Ronald L. Borcherding, Tremonton; William O. Munson, Brigham City; Michael S. McDonald, Mantua, and John A. Peterson, Brigham City, all of Utah, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 7, 1977, Ser. No. 775,140
Int. Cl.[2] F42B 9/16; C06B 45/22
U.S. Cl. 102—38 12 Claims



1. In a gun ammunition cartridge including a cylindrical, caseless propellant charge, a projectile bonded into one end thereof, and a primer cap bonded into the other end, a cavity being provided in the propellant charge adjacent the primer cap, the improvement comprising:

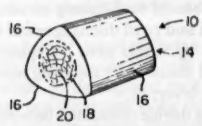
a particulate booster charge in the cavity wherein each particle comprises a single crystal ranging from 100 to 500 micron weight mean diameter selected from the group consisting of 1,3,5,7-tetramethylenetetranitramine and 1,3,5-trimethylenetrinitramine and a cured polyurethane coating on each crystal comprising about 30 to 55 weight % diisocyanate bitolylene, about 40 to 65 weight % hydroxyl-terminated polyethylene oxide, and about 5 to 15 weight % trimethylol propane.

4,091,730

GAS GENERATING CHARGE FOR OPEN CHAMBER GAS POWERED TOOL

David Dardick, 211 E. 70th St., New York, N.Y. 10021

Continuation-in-part of Ser. No. 570,909, Apr. 23, 1975, which is a continuation of Ser. No. 359,754, May 14, 1973, abandoned. This application Nov. 4, 1976, Ser. No. 738,953
Int. Cl.[2] F42B 3/04
U.S. Cl. 102—39 10 Claims



1. An open chamber gas generating charge for an open chamber gas powered tool, comprising:

a plastic jacket of noncircular cross section containing an opening for propellant extending longitudinally throughout and through the ends of the jacket,

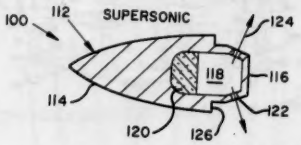
a nitrocellulose propellant disposed within said opening, said nitrocellulose being characterized as being in noncompressed expanded form that is readily ignited by an externally produced source including one of a spark and heated wire provided in the tool.

4,091,731

FUEL INJECTION WITH FLAMEHOLDING

Klaus C. Schadow, and Don J. Chieze, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 6, 1976, Ser. No. 702,641
Int. Cl.[2] F42B 5/10
U.S. Cl. 102—49.1 6 Claims



1. A rocket assisted projectile comprising:

a projectile body including an ogival nose portion and a bluff base;

a solid propellant motor in said body including a primer combustion chamber;

said combustion chamber communicating externally of said body through injector port means having at least one exit around the periphery of said body near said bluff base;

said body having a substantially uniformly increasing circular cross section from the forward end of said nose portion to a point just forward of said injector port means;

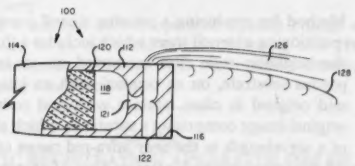
said body at said point being reduced sharply to present a step at a predetermined distance forward of said injector port means so that a recirculation zone is created behind said step and, when said motor is activated, the products of combustion from said chamber are injected into said recirculation zone.

4,091,732

FUEL INJECTION

Klaus C. Schadow, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 6, 1976, Ser. No. 702,387
Int. Cl.[2] F42B 15/10
U.S. Cl. 102—49.3 8 Claims



1. A projectile, comprising:

a body portion terminated in a bluff base and having an internal combustion chamber;

a solid propellant grain within said combustion chamber and configured to produce products of partial combustion;

a primary nozzle having a throat communicating with said combustion chamber, said throat being dimensioned to produce sonic flow of said products of partial combustion; and

secondary nozzle means having at least one passage extending through said body portion and communicating with

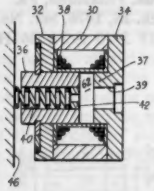
said primary nozzle throat for subsonically passing said products of partial combustion to the exterior of said body portion for further combustion of said products of partial combustion exterior to said body portion;

whereby said further combustion creates a pressure on said bluff base.

4,091,733
ELECTRICAL SETBACK GENERATOR

Richard Thomas Ziemba, Burlington, Vt., assignor to General Electric Company, Burlington, Vt.

Filed Feb. 17, 1977, Ser. No. 769,648
Int. Cl.² F42C *15/40*
U.S. Cl. 102—70.2 GA **8 Claims**



1. A setback generator for a projectile comprising:

an electrical conductor;

a normally open magnetic circuit including a source of flux disposed to provide inductive interaction with said conductor;

first means having a first, inoperative position, and a second, operative position for closing said magnetic circuit to increase said inductive interaction with said conductor;

second means for holding said first means in its inoperative position, and adapted to be disabled by the application in sequence of setback force and spin force;

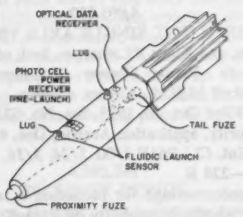
third means for shifting said first means from its inoperative position to its operational position, and operational subsequent to the disablement of said second means;

said first means, during the course and said shifting, serving to change said inductive interaction with said conductor to thereby induce a current in said conductor.

4,091,734
AIRCRAFT TO WEAPON FUZE COMMUNICATION LINK

Stephen L. Redmond, and Steven E. Fowler, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 22, 1977, Ser. No. 770,872
Int. Cl.² F42C *15/40*
U.S. Cl. 102—70.2 R **9 Claims**



1. An optical communications link comprising;

information transmitting means including an optical transmitter for transmitting information in digital format via a light beam;

power transmitting means for supplying a high-power light beam;

power receiver means on a receiving body for receiving the high power light beam and converting the beam to electrical energy;

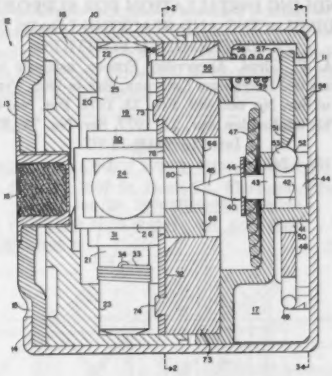
information receiver means included on said receiving body for receiving the information transmitted by said information transmitting means and being powered by the electrical energy from said power receiving means; and

data decoder means operatively coupled to said information receiver means for decoding the information transmitted in digital format.

4,091,735
STORED ENERGY IMPACT FUZE

Wilford E. Martwick, Minneapolis; John P. Ullrich, St. Paul, and Arnum E. Kraemer, Tonka Bay, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 3, 1964, Ser. No. 343,445
Int. Cl.² F42C *15/22*
U.S. Cl. 102—79 **10 Claims**



10. An impact fuze, comprising: a housing, detonating means mounted in said housing; a guide member mounted in said housing having an open chamber therein in line with said detonating means; resiliently biased firing pin means having a recess formed in an after portion thereof slidably mounted in said chamber; a seismic mass mounted for movement in said housing in response to the inertial forces developed upon impact; resiliently biased holding means mounted in said housing and engaging said seismic mass to hold said mass in a rest position adjacent said guide member; said guide member having a slot formed therein adjacent said seismic mass with said mass in said rest position; and detent means mounted in said slot and extending into said chamber; said mass means bearing against said detent means to hold said detent means in said recess in said firing pin means in said chamber under normal conditions; said firing pin means being released to initiate said detonating means upon an impact which causes said mass to move from said rest position thereby moving said holding means and releasing said detent means.

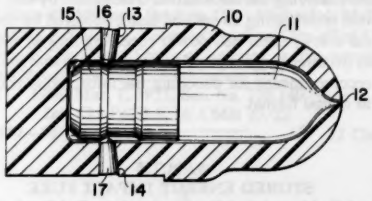
4,091,736
INCAPACITATING ANTI-PERSONNEL SMALLARMS PROJECTILE

William Robert Mizelle, 1330 New Hampshire Ave. NW, Washington, D.C. 20036

Filed Feb. 10, 1977, Ser. No. 767,457
Int. Cl.² F42B *11/36*
U.S. Cl. 102—92.7 **9 Claims**

1. A low-lethality projectile capable of incapacitating a living target notwithstanding the projectile's having a weight and mass light enough to make it unlikely to penetrate human

or animal tissue sufficiently to cause a serious wound or a blunt trauma, and comprising means for generating intense heat in a



suitable volume of air upon impact within a selected range upon an intended target.

4,091,737

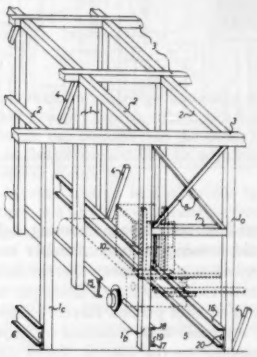
HANDLING INSTALLATION FOR SUPPORTING DISPLACING AND STACKING LOADS IN PREDETERMINED POSITIONS

Marcel A. P. Giros, Ancerville, France, assignor to Societe Anonyme des Elevateurs Lateraux, Bar-le-Duc, France

Division of Ser. No. 660,449, Feb. 23, 1976, Pat. No. 4,056,201. This application Apr. 22, 1977, Ser. No. 789,875

Int. Cl.[2] B61B *12/02*

U.S. Cl. 104—242 **1 Claim**



1. A vehicle and an installation for supporting said vehicle on substantially horizontal support surfaces having a gap extending between them,

said vehicle having tired support wheels for carrying the vehicle on a floor;

said horizontal support surfaces being spaced above said floor;

at least one pair of driving wheels;

at least one pair of steerable wheels, and

a plurality of flanged metal rollers, each flanged metal roller being connected to each one of said pair of driving wheels and steerable wheels, respectively, for supporting the vehicle on said support surfaces for movement along said gap;

the flanged metal rollers having inner flanges for guiding the vehicle along the gap and

the height of the horizontal surfaces being sufficient to raise the tired support wheels off the ground when the vehicle moves along the gap, and when the vehicle is supported by said metal rollers resting on said support surfaces;

said flanged metal rollers on said corresponding driving wheels being larger in diameter than said flanged metal rollers on said corresponding steerable wheels, and

said horizontal support surfaces comprising at least one upper horizontal track surface and one lever horizontal track surface,

the spacing between said upper and lower horizontal track surfaces being greater than the diameter of said flanged metal rollers corresponding to said driving wheels;

whereby, if said vehicle is caused to be tilted when said flanged metal rollers are normally operating between said upper and lower horizontal track surfaces, the flanged metal rollers corresponding to said driving wheels remain in contact with the track surfaces, so that the vehicle can be displaced in said tilted condition.

4,091,738

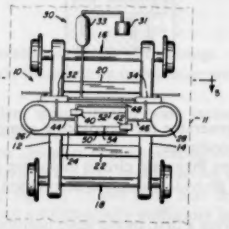
STABILIZED FLUID RAILWAY CAR SUSPENSION

David K. Platner, Atchison, Kans., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Feb. 18, 1976, Ser. No. 658,927

Int. Cl.[2] B61F *5/10, 5/24;* B61H *9/04, 11/00*

U.S. Cl. 105—164 **7 Claims**



1. A railway truck comprising a frame member, a car support member extending laterally of said frame member, air spring means mounted at either end of said car support member for supporting a car body, a source of air pressure, means to connect said air spring means to said source of air pressure, air pressure actuated control valves respectively associated with the air spring means at either end of said support member adapted to prevent the escape of pressure from respective air spring means in valve closed position and to exhaust pressure from respective air spring means in valve open position, pressure responsive control means associated with each of said control valves respectively for moving said valves between said valve open position and said valve closed position, means connecting said control means for communication with the air spring means at the opposite end of said car support member so that normal air pressure therein will maintain said control valve in said valve closed position and loss of said pressure therein to a selected value substantially below said normal air pressure will cause said control means to move said control valve to said valve open position.

4,091,739

RESILIENT SINGLE AXLE TRUCK

Josef Theurer, and Klaus Riessberger, both of Vienna, Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft M.B.H., Vienna, Austria

Filed Oct. 20, 1975, Ser. No. 623,589

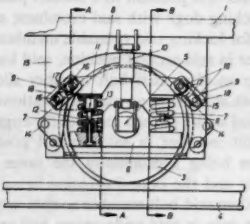
Claims priority, application Austria, Dec. 6, 1974, 9791/74

Int. Cl.[2] B61F *3/00, 5/24, 5/36, 5/50*

U.S. Cl. 105—224 R **4 Claims**

1. In an undercarriage for mounting a track maintenance vehicle with wheels for mobility on a track, which comprises an undercarriage bogie frame, an axle carrying the vehicle wheels, a bearing for each end of the axle, resiliently yielding means mounted between the bogie frame and each axle bearing, the resiliently yielding means including at least two coil springs and at least one hydraulic shock absorber for damping movement between the bogie frame and axle bearings in all spatial directions, a yoke-like spring shield for the coil springs

associated with each axle bearing, a link suspension linking each of the spring shields to the undercarriage bogie frame, an elastic stop mounted on the bogie frame laterally adjacent each of the link suspensions to limit movement of each of the link suspensions in a transverse direction, each elastic stop comprising a torsion rod having one end affixed to the bogie frame and a free end opposite to the one end, the free end carrying a block of elastic material and a casing for each axle bearing, the coil springs being mounted between the spring shields and the bearing casings, and the hydraulic shock absorber being mounted between the bogie frame and the bearing casings.

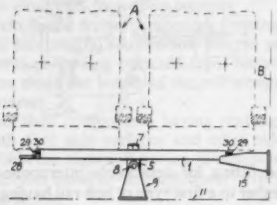


4,091,740

CHAIR APPARATUS FOR USE IN TRANSPORT MEANS

Svein O. Lie, 2391 Moelv, Norway

Filed Sept. 17, 1976, Ser. No. 725,136
Claims priority, application Norway, Sep. 18, 1975, 753180
Int. Cl.[2] B60N *1/02*
U.S. Cl. 105—345 **7 Claims**



1. An apparatus for use with seats, such as twin chairs positioned side by side in a railway coach where the said seats are rotatably mounted about a vertical central axis for rearrangement of the seats after a change of driving direction of the railway coach and have means to lock said chairs in a desired position, said apparatus including: a seat support structure located centrally of said seats with vertical and horizontal pivot means for the rotation of the seats as a combined unit thereabout means for tilting said seats about the horizontal axis which axis is transverse to the longitudinal axis of said seats; coupling means at each end of said seats that releasably lock into engagement with corresponding coupling means attached to the adjacent wall of said coach, whereby when the coupling means is released said seats can be pivoted about the horizontal axis and can subsequently be rotated about the vertical axis and when the coupling means is locked said seats are fixedly maintained in an adjusted first working position.

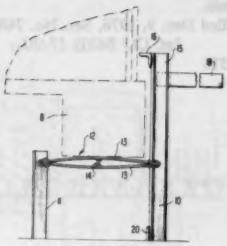
4,091,741

SECURITY DEVICE

Albert W. Hartkorn, Hershey, Pa., assignor to American Multi-Lert Corporation, Hershey, Pa.

Filed Aug. 19, 1975, Ser. No. 605,879
Int. Cl.[2] E05B *65/16*
U.S. Cl. 105—366 R **15 Claims**

4. A security device for limiting the opening movement of a swinging door of a container seated on a supporting surface, said device comprising a generally horizontal shelf portion adapted to be supported on the surface and to receive a portion of the container seated thereon so that said device is pressurally engaged between the container and the supporting surface, whereby said device is held in position, wherein the shelf portion is yieldable under the weight of the container, upright supporting members attached to the shelf portion for holding the shelf portion in an elevated position above the supporting surface, and an upright arm secured rigidly to the shelf portion in the path of opening movement of the swinging door when the container is seated on the shelf portion.

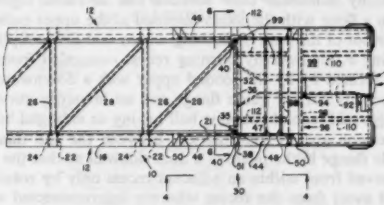


4,091,742

STACKED CONTAINER WELL HOLE GONDOLA CAR

Eugene J. Cordani, 1800 St. Denis Ct., Florissant, Mo. 63033

Filed Jul. 28, 1976, Ser. No. 709,251
Int. Cl.[2] B60P *7/10*; B61D *3/08, 3/16*; B65J *1/22*
U.S. Cl. 105—366 D **23 Claims**



1. A railway car comprising:

longitudinally spaced car end portions located at opposite ends of the car, including a stub sill and a transversely extending car body bolster; vertically extending side sills transversely spaced on opposite sides of the car extending longitudinally of the car and connected at opposite ends to said car end portions; longitudinally spaced transverse bulkheads extending transversely across the car attached to the inner ends of said car end portions, and extending vertically above said end portions; lading support means attached to the lower end portions of said side sills and to said transverse bulkheads; transversely spaced end side sills, foreshortened relative to said side sills, attached to said side sills and extending outwardly along each end portion of the car outboard of said transverse bulkhead; said side sills, transverse bulkheads and lading support means defining a depressed center section in said car; and bulkhead supports including transversely spaced first support members joining said side sill with the upper portion of said bulkhead, and at least one second support member joining the upper portion of said bulkhead and said car end portion; said bulkhead supports transmitting at least a portion of the lading loads downwardly respectively into said side sill and into said car end portion, and transmitting at least a portion of the longitudinal coupler loads applied to the end portion of the car upwardly into

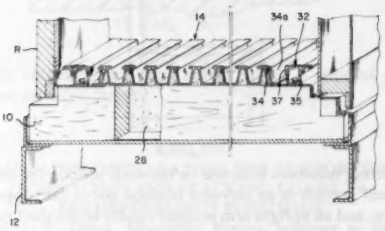
said transverse bulkhead and then downwardly into said side sill.

4,091,743

FLOOR STRUCTURE FOR REFRIGERATED VEHICLES

Lucien W. Lemon, Renton, Wash., assignor to Paccar Inc., Bellevue, Wash.

Filed Dec. 9, 1976, Ser. No. 748,874
Int. Cl.² B61D *17/10*
U.S. Cl. 105—375 **4 Claims**



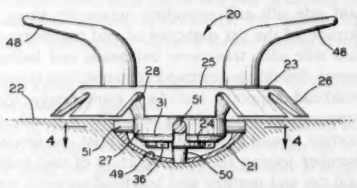
3. A modular floor for a refrigerated vehicle comprising multiple floor sections each having first and second upwardly opening ducts each having upwardly and outwardly extending sidewalls joined by a flat bottom wall and interconnected by a first horizontal upper web, a second horizontal upper web extending laterally outwardly of a sidewall at the end of said second duct and terminating in a first coupling half, and said first duct having a second coupling half at the upper end of a sidewall of the opposite end of the duct interconnectable to the upper end of the first coupling half of an adjacent floor section whereby numerous floor sections can be fitted together to form a floor with the joints disposed at the upper ends of the floor out of the path of flushing water, said first coupling half having a downwardly opening recess concealed from above and formed by by the second upper web a downwardly and outwardly curved guide flange and an inwardly curved end flange, said second coupling half having an enlarged bead of a dimension greater than the gap between the end flange and guide flange in the plane of a duct sidewall so that the bead is removed from within an adjacent recess only by rotating the bead away from the recess whereby interconnected sections are tightly locked against relative vertical movement and whereby the first and second coupling halves form the only point of contact between adjacent floor sections.

4,091,744

PORTABLE DECK CLEAT

Charles F. Crissy, and Christopher L. T. Corbin, both of Jackson, Mich., assignors to Aeroquip Corporation, Jackson, Mich.

Filed Oct. 26, 1976, Ser. No. 735,456
Int. Cl.² B60P *7/08*
U.S. Cl. 105—475 **9 Claims**



1. A tie-down device for releasable attachment to an anchor having a plurality of crossbars comprising:

a. a stationary member;

b. a plurality of torque lugs on said stationary member for engaging the crossbars;

c. a rotatable member mounted on said stationary member;

d. a plurality of locking dogs on said rotatable member alignable with said torque lugs in a first position;

e. means for facilitating movement of said rotatable member from said first position to a second position for engaging said locking dogs with said crossbars; and

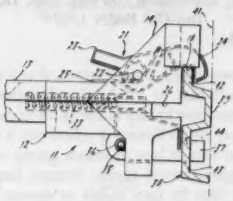
f. means for locking said rotatable member to said stationary member in said second position, said locking means comprising: an elongated bolt member slidably mounted in said rotatable member, and said stationary member being provided with opposed recesses for engaging both ends of said bolt member in said second position, one of said recesses being substantially the same size as said bolt member and the opposite recess being circumferentially wider than said bolt member so that when said bolt member lies only in said wide recess and said rotatable member, said rotatable member can move relative to said stationary member between said first and said second positions.

4,091,745

CROSS BAR END FITTING

Edward Patch, Dearborn Heights, Mich., assignor to Evans Products Company, Portland, Oreg.

Filed Mar. 11, 1976, Ser. No. 666,082
Int. Cl.² B60P *7/08, 7/16;* B61D *45/00, 49/00*
U.S. Cl. 105—498 **17 Claims**



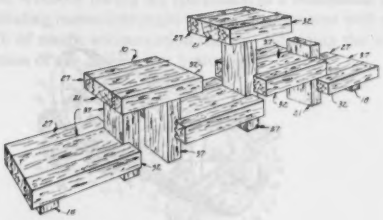
1. An end fitting for detachably interconnecting a freight bracing member to a first type of belt rail having a horizontally disposed leg with longitudinally spaced openings and a second type of belt rail having a vertically upstanding portion and a portion formed with longitudinally spaced openings in a vertical face thereof below said upstanding portion, said end fitting having a first latch member movable relative to said end fitting between a latched position, an intermediate position and a released position, said first latch member being comprised of at least one downwardly extending projection adapted to extend through a selective aperture in the first type of belt rail when said first latch member is in its latched position to fix said end fitting longitudinally and tranversely to the first type of belt rail, said projection being spaced from the selected aperture in the first type of belt rail when said first latch member is in its released position, a first part being adapted to underlie the horizontally disposed leg of the first type of belt rail for detachably affixing said end fitting against vertical movement relative to the first type of belt rail, said downwardly extending projection of said first latch member being adapted to extend behind the vertically upstanding projection of the second type of belt rail when said first latch member is in its intermediate position to fix said end fitting transversely to the second type of belt rail, said downwardly extending projection being positioned above the vertically upstanding projection of the second type of belt rail when said first latch member is in its released position, and a second part having a portion adapted to enter into a selected one of the apertures of the second type of belt rail for detachably affixing said end fitting against longitudinal and vertical movement relative to said second type of belt rail.

4,091,746

ARTICLE OF FURNITURE

James Alvin Kimbrough, SW. 135 State St., Apt. 2, Pullman, Wash. 99163

Filed Oct. 18, 1976, Ser. No. 733,080
Int. Cl.[2] A47B 3/06
U.S. Cl. 108—153 5 Claims



1. An article of furniture, comprising:
three elongated frame components, each having rectangular cross sections with face side surfaces and edge side surfaces extending between ends and with equal widths between edge side surfaces and equal thicknesses between face side surfaces;
dovetail joint means interlocking said frame components together to form two spaced supporting uprights and an interconnecting horizontal shelf;
wherein the dovetail joint means include: (1) male dovetail joint elements formed on two or more ends of the elongated frame components, and complementary female dovetail joint elements recessed in one or more side surfaces of the elongated frame components;
wherein the elongated frame component forming the horizontal shelf has integral longitudinal tongue and groove joint elements projecting outward from respective edge side surfaces along the length of the one elongated furniture component;
two elongated shelf components having rectangular cross section with face side surfaces and edge side surfaces extending between ends and having thicknesses between face side surfaces equal to the thicknesses of the elongated frame components;
wherein each of the shelf components has a longitudinal tongue and groove joint element along one edge side surface thereof interfitting with a corresponding tongue and groove joint element of the one frame component to enable the elongated shelf components to be securely attached to opposite edge side surfaces of the one frame component and overlap and hide the interlocking male and female dovetail joint elements to prevent the male and female dovetail joint elements from being unintentionally disjoined and to provide an extended horizontal shelf beyond the width of the one elongated frame component;
wherein the elongated frame component forming the horizontal shelf and each of the shelf components have a face side surface that is smooth and forms a flush extended shelf surface.

4,091,747

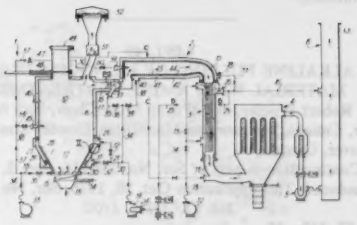
WASTE INCINERATOR SYSTEM

Charles Edgar Chase, Mississauga, Canada, assignor to Trecan Ltd., Canada

Filed Mar. 22, 1976, Ser. No. 668,918
Claims priority, application Canada, Jan. 7, 1976, 243102
Int. Cl.[2] F23G 5/12; F23L 9/04, 9/06
U.S. Cl. 110—210 9 Claims

1. A waste incinerator system for incinerating a batch of solid waste, said system including a combustion chamber having flue outlet means including an afterburner, said combustion chamber being of the type of an upright, generally cylindrical vessel having a heat resistant steel inner shell and a metal outer shell, said shells being arranged in a concentric fashion to provide an intermediate space for passage of temperature control air,

(a) the lower end of said combustion chamber being detachably secured to a downwardly converging frusto-conical bottom section the lower end of which terminates at an ash outlet;



(b) means for introducing temperature control air into said intermediate space; and

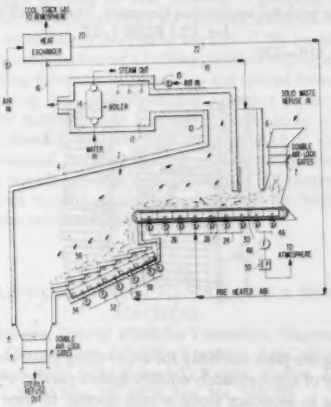
(c) means for discharging said air from said intermediate space, said means for discharging said air from said intermediate space being arranged for discharging the air into said flue outlet means.

4,091,748

METHOD AND APPAPATUS FOR PRODUCING GAS FROM SOLID MUNICIPAL WASTE

Vaughn Mansfield, Gallatin, Tenn., assignor to Mansfield Carbon Products, Inc., Gallatin, Tenn.

Filed Dec. 3, 1976, Ser. No. 747,192
Int. Cl.[2] F23G 5/00
U.S. Cl. 110—228 7 Claims



1. Apparatus for producing gas from solid municipal waste comprising, in combination
a furnace having
a chamber,
an elongate horizontally moving grate therein, infeed means for depositing material onto one end of said horizontally moving grate, a reciprocating step grate having an upper end disposed below the other end of the horizontally moving grate for receiving said material as the latter drops off the other end thereof,
outfeed means for receiving material dropping off the lower end of the reciprocating step stoker,
air lock means for said infeed and outfeed means for restricting the passage of air therethrough into said fur-

nace chamber, zoned airbox means beneath said grates, means for feeding controlled amounts of air to the material on said grates through the zones of said airbox means,

an exhaust conduit leasing from said furnace chamber, and a boiler having a combustion chamber connected to said exhaust conduit for burning gases exhausted from said furnace.

4,091,749

ALKALINE PULPING OF LIGNOCELLULOSIC MATERIAL WITH AMINE PRETREATMENT

Alan Robert Procter, and Wayne Ming Chow, both of Vancouver, Canada, assignors to MacMillan Bloedel Limited, Vancouver, Canada

Continuation-in-part of Ser. No. 538,116, Jan. 2, 1975, abandoned. This application Oct. 20, 1976, Ser. No. 734,184

Int. Cl.² D21C *1/00*

U.S. Cl. 162—25 **11 Claims**

1. In a process for pulping raw lignocellulosic material, the steps which comprise pretreating the lignocellulosic material with an aqueous solution containing from about 0.1 to 10% by weight of an aliphatic amine selected from monoethanolamine, methylamine and dimethylamine and thereafter subjecting the pretreated lignocellulosic material to digestion with sodium hydroxide alone at a sodium hydroxide application of at least 8% by weight expressed as sodium oxide based on the dry weight of said raw lignocellulosic material.

4,091,750

GRATE PLATE ARRANGEMENT FOR A TRAVELLING GRATE

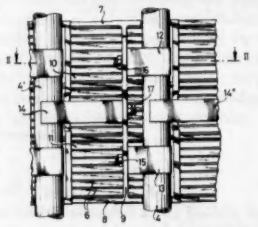
Ingo Thiesler; Max Weiner, both of Neubeckum, and Karl Steffens, Hamm, all of Germany, assignors to Polysius AG, Neubeckum, Germany

Filed Jan. 28, 1977, Ser. No. 763,692

Claims priority, application Germany, Mar. 13, 1976, 2610736

Int. Cl.² F23B *1/22*

U.S. Cl. 110—329 **6 Claims**



1. A grate plate assembly for a travelling grate comprising a plurality of approximately equally spaced parallel pin members movable in sequence along a path normal to their lengths, a plurality of grate plates each spanning adjacent pairs of said pin members and each including a forward portion bearing on a pin member and a rear portion bearing on the next adjacent following grate plate, and a web extending from each of said grate plates into the space between the adjacent pin members, a unitary grate plate holder for each grate plate with each said holder comprising a pair of arms extending beneath the pin member on which the grate plate bears and connected to the forward portion of its grate plate in front of the pin member and a rearwardly directed arm extending beneath the next adjacent following pin member and a web extending into the space between the adjacent pin members in overlapping relationship with the web of said great plate, openings formed in the webs of said great plate and said grate plate holder, and fastening means extending through said holes.

4,091,751

PLANTING MACHINE

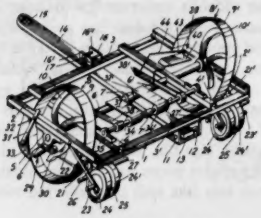
Alfredo Félix Dri, and Jorge César Miranda, both of Paso de los Libres, Montevideo 893, Prov. Corrientes, Ark.

Filed Mar. 15, 1977, Ser. No. 777,734

Claims priority, application Argentina, Mar. 17, 1976, 262598

Int. Cl.² A01C *11/00, 23/02*

U.S. Cl. 111—2 **11 Claims**



1. Automatic planting machine for planting in rows, small trees and the like into the bottom of a furrow opened in the soil, said furrow may be opened by the same machine, said machine comprising a chassis having at least a pair of sides, a main wheel at each side of the chassis, independent axles for each main wheel and rotatably supported by said chassis, each main wheel having a rim, at least one through aperture in each rim, a planter having a planting tube slidably mounted in each of said through apertures and timed with the rotation of the corresponding main wheel to project to the outside of said through opening and rim upon said through opening facing the bottom of said furrow, each planting tube having an input end, and means capable of feeding plants, one at a time, into the input end of each planting tube to enable planting of said plant into the bottom of said furrow upon said through opening facing the bottom of said furrow.

4,091,752

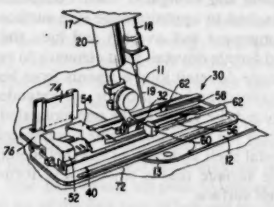
BUTTONHOLE GAUGING PRESSER DEVICE

Charles Robert Odermann, Montville, N.J., assignor to The Singer Company, New York, N.Y.

Filed Apr. 13, 1977, Ser. No. 787,182

Int. Cl.² D05B *3/06, 3/24*

U.S. Cl. 112—75 **6 Claims**



1. A buttonhole gauging presser device for a sewing machine having a presser bar, a work feeding mechanism for transporting work fabrics in a transverse direction across said sewing machine, and a needle carried for endwise reciprocatory movement in a path located in front of the presser bar in the direction of work feed, said buttonhole gauging presser device comprising:

a. a presser foot adapted to be secured to the sewing machine presser bar and including work fabric constraining means contiguous to the path of needle reciprocation;

b. a work engaging shoe slidably constrained on said presser foot for movement with said work fabrics in the direction of work feed;

c. stop means on said work engaging shoe for establishing a forwardmost position in front of the presser bar in the direction of work feed; and

d. indicating means adjustably positionable on said work engaging shoe at a distance in front of the location of said path of needle reciprocation which, when said work engaging shoe occupies said forwardmost position in front of said presser bar, is equal to the desired length of a buttonhole, whereby during the fabrication of a buttonhole, said indicating means is brought into visual alignment with said path of needle reciprocation thereby indicating the completion of the desired size buttonhole.

4,091,753

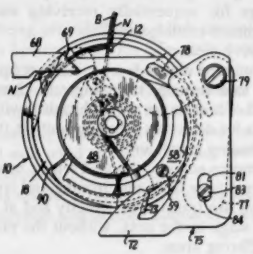
BOBBIN THREAD PULL-OFF FOR LOCKSTITCH LOOPTAKER

Ralph Edward Johnson, Convent Station, and Donald Rodda, Butler, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Jan. 13, 1977, Ser. No. 759,515

Int. Cl.[2] D05B *57/14*

U.S. Cl. 112—184 **3 Claims**



1. A lockstitch forming looptaker for a sewing machine having a thread carrying needle which is endwise reciprocal in a path cooperating with said looptaker through a needle aperture in a work supporting plate and thread take-up means synchronized with said endwise reciprocal movement of said thread carrying needle for setting a stitch at one position and for controlling needle thread at other positions, said looptaker comprising a circularly moving looptaker body with a needle thread loop seizing beak and formed with an annular raceway for accommodating a bobbin case constrained against motion with said looptaker, said bobbin case being of a variety having thread guiding means thereon located opposite the point of seizure of said needle loop by said looptaker beak for directing a bobbin thread from a bobbin accommodating cavity in said bobbin case in a path from said thread guiding means to said needle aperture in said work supporting plate between said stationary bobbin case and said circularly moving looptaker body, and separable bobbin thread manipulating means attachable to said looptaker body in a position to act on said bobbin thread after setting said stitch at said one position of said take-up means and prior to endwise passage of said sewing needle through said needle aperture toward said looptaker body for urging said bobbin thread into a preferred orientation with respect to said sewing needle to preclude half hitching and for drawing a supply of bobbin thread from said bobbin accommodating cavity.

4,091,754

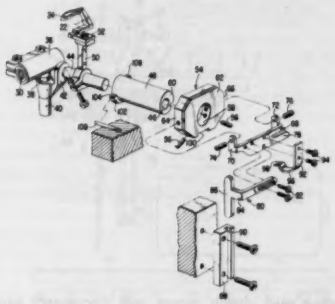
LOOPER THROW-OUT MECHANISM FOR SEWING MACHINE

Eli N. Onembo, Clark, N.J., assignor to The Singer Company, New York, N.Y.

Filed Mar. 16, 1977, Ser. No. 778,209

Int. Cl.[2] D05B *57/02*

U.S. Cl. 112—200 **8 Claims**



1. In a sewing machine of the type comprising reciprocable needle means for cooperating with a looper having an eye adapted for carrying thread, the looper being supported in the machine on a looper carrier for oscillatory rocking movement in timed relationship with the needle means, said looper carrier including a shaft, and a bushing journaled in the bed and having an eccentric bore for receiving said shaft, the improvement comprising looper throw-out means for selectively rotating said bushing to bodily move said looper to a retractred position for threading and for locking said looper in the operative position, said looper throw-out means including a bushing support block secured to said bushing, a grasping member journaled on the support block for pivoting about an axis lying in a plane substantially normal to the axis of the bushing, said grasping member including a locking member having a locking bolt extending substantially parallel to and spaced from the axis of the bushing, and means defining a socket in the sewing machine for receiving said bolt and for restraining rotational movement thereof, whereby said support block is restrained against rotational movement until said grasping member is pivoted to release said bolt from the socket and thereafter the support block may be rotated to bodily move the bushing and looper to the retracted position.

4,091,755

THREAD WINDING MECHANISM FOR A SEWING MACHINE

Hitoshi Ishikawa, Toyota; Kimihiko Yamamoto, Nagoya; Toshio Sawada, Okazaki, and Takahiko Kasahara, Anjo, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 10, 1976, Ser. No. 740,754

Claims priority, application Japan, Nov. 13, 1975, 50-155000[U]

Int. Cl.[2] D05B *59/00*; B65H *54/18*

U.S. Cl. 112—279 **2 Claims**

1. A thread winding mechanism for a sewing machine comprising:

a main drive shaft for a sewing mechanism rotatably mounted on a head part of the machine,

a flywheel rotatably mounted on said drive shaft but restrained against axial movement relative thereto,

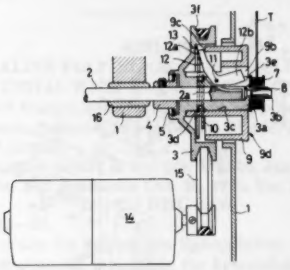
a drive motor,

means coupling said drive motor with said flywheel,

a thread winding shaft integral with and extending outwardly from one end of said flywheel for receiving a bobbin to be wound,

clutch means mounted on said flywheel for connecting and disconnecting said main drive shaft with said flywheel, and

a handwheel mounted on said flywheel and rotatable therewith and surrounding said thread winding shaft, said handwheel also being movable in an axial direction on said flywheel from an outward position to an inward position



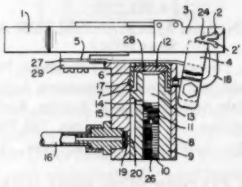
to engage said clutch means and disconnect said main drive shaft from said flywheel and expose said thread winding shaft, the outer end face of said handwheel being located in substantially the same plane as the outer end face of said thread winding shaft thereby to conceal the latter when said handwheel occupies its outward position and said flywheel is connected to said main drive shaft by said clutch means.

4,091,756

PNEUMATICALLY DRIVEN THREAD CUTTER

Wolf-Rüdiger von Hagen, Hemmingen, Germany, assignor to Union Special G.m.b.H., Stuttgart, Germany

Filed Feb. 24, 1977, Ser. No. 771,499
Claims priority, application Germany, Mar. 31, 1976, 2613728
Int. Cl.[2] D05B 65/06
U.S. Cl. 112—287 **11 Claims**



1. A thread chain cutting device including tube means for receiving said thread chain, an opening in said tube means for allowing passage of said chain into said tube means, a stationary knife means and a moveable knife means disposed closely adjacent said opening means for cutting said chain, and actuating means comprising:

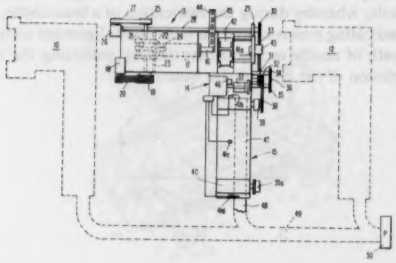
a fluid operated pulsator means in operative engagement with said moveable knife means for forcibly driving said moveable knife means into a cutting relationship with said stationary knife means in a series of substantially uninterrupted non-harmonic feed movements.

4,091,757

UNITIZED CAN MANUFACTURING SYSTEM

Joseph J. Urban, Pleasantville, N.Y., assignor to Crown Cork & Seal Company, Inc., Philadelphia, Pa.

Filed Dec. 10, 1976, Ser. No. 749,296
Int. Cl.[2] B21D 51/26
U.S. Cl. 113—7 R **15 Claims**



1. Apparatus for manufacturing cans from metal blanks, comprising:

an ironing stage having a reciprocatory carriage and a ram carried thereby and including an ironing die for receiving a metal blank carried by said rams;

a trimming stage coupled in direct juxtaposition to said ironing stage for sequentially receiving newly-formed containers and trimming the open ends thereof in synchronism with the operation of said ram;

a cleaning stage coupled in direct juxtaposition to said trimming stage for sequentially receiving and discharging newly-trimmed containers;

a primary drive means;

power transmission means mechanically coupling said drive means to said ironing, trimming and cleaning stages to operate all of said stages in synchronism with one another;

sensor means for detecting a discontinuity in the flow of cans to said cleaning stage; and

disconnect means actuated by said sensor means for removing motive power from said ironing and trimming stages;

whereby cans are transferred directly and at identical rates from one stage to the next, without the presence of conveyor buffering areas.

4,091,758

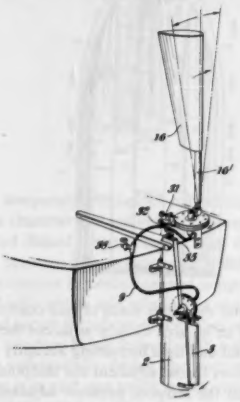
WIND-CONTROL RUDDER FOR YACHTS

Carl-David Rosen, Karlavagen 21, S-352 44 Vaxjo, Sweden

Filed Oct. 26, 1976, Ser. No. 735,905
Claims priority, application Sweden, Nov. 10, 1975, 7512600
Int. Cl.[2] B63H 25/12
U.S. Cl. 114—144 C **9 Claims**

4. A wind-operated automatic steering gear for use on a water-going vessel to correct for deviations of said vessel from a desired course of travel, said steering gear comprising a housing, a wind vane pivotally mounted on said housing for being set in a neutral position and for being moved from such neutral position by the wind when the vessel deviates from said desired course, a main steering rudder, a servo-rudder hinged to the after edge of said steering rudder such that movement of said servo-rudder produces an opposite movement of said steering rudder, and a closed movement-transmission system connecting said wind vane to said servo-rudder; said transmission system comprising a first pressure chamber in said housing, one side of which chamber is closed by a first flexible diaphragm; a second pressure chamber, one side of which is closed by a second flexible diaphragm, said pressure chambers containing a pressure transmission medium and communicating with one another through at least one pressure-medium line, the arrangement being such that movement of one diaphragm is accompanied by a corresponding movement of the other diaphragm, a push-pull rod extending through one side

of said housing and being connected at one end to a central section of said first diaphragm, a linkage system connecting the other end of said rod to said wind vane, said push-pull rod being effective to cause movement of said first diaphragm or said vane in response to movement of said vane or said first diaphragm respectively, said second diaphragm is connected to said servo-rudder by a further actuating device effective to move said second diaphragm or said servo-rudder in response to movement of said servo-rudder or said second diaphragm respectively, the housing on a side thereof remote from the



push-pull rod being provided with a hub pivotally mounted in a carrier means having means for being attached to the water-going vessel, said hub having a through-flow passage communicating with said at least one pressure medium line, said passage having an area which is smaller than the area of the diaphragm, and resetting means operably connected to said steering rudder and said wind vane for moving said wind vane in response to movement of said steering rudder to return said wind vane to its neutral position and thereby resist over-travel of said vessel beyond said desired course of travel.

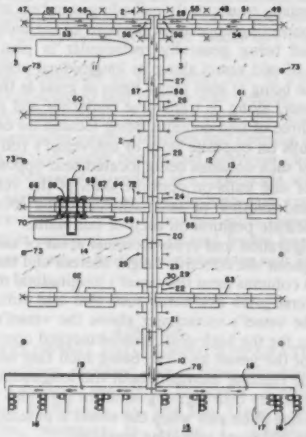
4,091,759

FLOATING DOCK FOR HANDLING CARGO

Diomedes Liu, Summit, N.J., assignor to Sea-Land Service, Inc., Elizabeth, N.J.

Filed Aug. 30, 1976, Ser. No. 718,760
Int. Cl.[2] B65G *63/00*
U.S. Cl. 114—263 **5 Claims**

1. A floating dock for transporting cargo from and to a vessel comprising; a series of longitudinally-extending cargo-conveying supporting means, means retaining said cargo conveying supporting means in a floated and aligned condition, cargo conveying means affixed to said longitudinally-extending cargo-conveying supporting means to transport cargo along said cargo-conveying supporting means in a directed path of travel, pivotally-connected conveying means joining said affixed conveying means, means for mooring a vessel adjacent to said longitudinally extending cargo-conveying supporting means for unloading or loading cargo from said cargo-conveying means, at least one transversely-extending cargo-conveying supporting means cooperatively operable with said longitudinally-extending cargo-conveying supporting means, means for retaining said transversely-extending cargo-conveying supporting means in a floated and aligned condition, cargo-conveying means affixed to said transversely-extending cargo-conveying supporting means to transport cargo along said transversely extending cargo conveying sup-



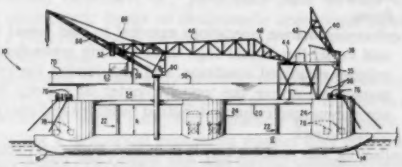
porting means to said cargo-conveying means on said longitudinally-extending cargo-conveying supporting means.

4,091,760

METHOD OF OPERATING TWIN HULL VARIABLE DRAFT VESSEL

Samuel Harry Lloyd, III, Mill Valley, Calif., assignor to Santa Fe International Corporation, Orange, Calif.

Continuation of Ser. No. 529,061, Dec. 3, 1974, abandoned, which is a continuation of Ser. No. 177,219, Sep. 2, 1971, abandoned, which is a division of Ser. No. 766,662, Sep. 4, 1968, Pat. No. 3,616,773, which is a continuation-in-part of Ser. No. 666, 395, Sep. 8, 1976, abandoned. This application Jul. 23, 1976, Ser. No. 708,133
The portion of the term of this patent subsequent to Nov. 2, 1988, has been disclaimed.
Int. Cl.[2] B63B *35/00*
U.S. Cl. 114—264 **23 Claims**



1. A method of operating a variable draft vessel of the type characterized by

a pair of elongated hulls disposed in substantially parallel spaced side-by-side relation with each of said hulls spaced from and lying on an opposite side of the longitudinal centerline of said vessel;

a working platform spaced above said hulls a predetermined height and normally lying in a generally horizontal plane;

means for supporting said platform in fixed spaced relation above said hulls including at least three pairs of upstanding columns connecting with each of said hulls and said platform, each of said columns having a substantially constant cross sectional area over the effective height of the column between the platform and associated hull;

each of said hulls having an oblong transverse cross section with a breadth greater than its height and having top and bottom substantially planar parallel surfaces extending substantially the entire length of each hull;

a plurality of longitudinally spaced structural means interconnecting and reinforcing the structural relationship of the hulls, platform and columns; such means including substantially transversely extending members structurally interconnecting uppermost portions of the hulls;

said vessel being generally rectangular in plan with the length of said vessel along its longitudinal centerline and roll axis being at least plural times as great as the width of said vessel along its transverse centerline and pitch axis;

at least three of said columns being located on each of said two hulls on opposite sides of the vessel's roll axis; with pairs of such columns being located near opposite ends of each of said hulls on opposite sides of the vessel's pitch axis, and another of said columns being located at an intermediate position on each of said hulls;

the configuration and cross-sectional areas of said columns throughout the effective height thereof and the distances of said columns from the vessel's longitudinal roll axis and transverse pitch axis being such that said columns maintain the vessel's metacenter above the vessel's center of gravity for the high draft semisubmerged operating positions of the vessel and also being such that said columns provide righting moment about the longitudinal roll axis which is less than righting moment provided about said transverse pitch axis when the vessel is in semisubmerged column stabilized operating position;

said hulls having ballast compartments; and means for ballasting said vessel when required to alter its draft between a low draft hull-supported floating condition in which the hulls have freeboard with said transversely extending members structurally interconnecting uppermost portions of the hulls being disposed above the mean waterline and a high draft semisubmerged column stabilized floating and operating condition in which the mean waterline is located along intermediate portion of said columns above said hulls and below the underside of said platform;

said method comprising the steps of:

moving the vessel when required in a low draft floating condition with said oblong cross section hulls having freeboard and with said transversely extending members interconnecting said hulls normally being above mean waterline;

ballasting the vessel to submerge said hulls and also portions of said columns below the mean waterline to provide a high draft semisubmerged column stabilized floating and operating condition with the mean waterline located between the tops of the hulls and the underside of the platform;

performing marine operations external to said vessel when said vessel lies in said high draft floating semisubmerged column stabilized condition, and maintaining the vessel's metacenter above the vessel's center of gravity for all semisubmerged column stabilized positions and operations of the vessel;

ballasting the vessel when it is in said high draft semisubmerged operating condition to adjust the vessel's angle of trim about its pitch axis when required during operation of the vessel in said semisubmerged column stabilized condition;

ballasting the vessel in said high draft semisubmerged condition to adjust the vessel's angle of heel about its roll axis when required during operations in said semisubmerged column stabilized condition;

deballasting the vessel to return the vessel to the low draft condition with the hulls having freeboard.

4,091,761

MODIFIED TUNNEL HULL BOAT

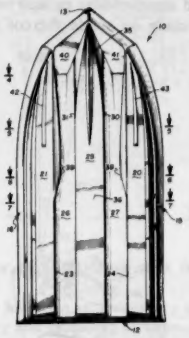
Allan J. Fehn, 1601 Gardena Ave., Minneapolis, Minn. 55432

Filed Mar. 23, 1977, Ser. No. 780,481

Int. Cl.[2] B63B *1/20*

U.S. Cl. 114—290 **6 Claims**

1. A modified tunnel hull boat having two sponsons extending downwardly and having facing inner walls which extend generally vertically to define with the bottom a tunnel, said sponsons each having outer walls that approach the inner walls as they extend downwardly so that the lowermost portion of each sponson is very narrow to provide little planing effect, a center rib projecting downwardly from the bottom of the boat into said tunnel and having a relatively wide lower wall which acts as a planing surface, the distance between the inner walls



of said sponsons and the outer walls of said center rib decreasing from the bow to an area closely adjacent the midpoint of the boat fore and aft and then increasing abruptly thereafter so as to create a venturi throat adjacent the midpoint of the boat fore and aft so that the reduced pressure adjacent the venturi throat tends to minimize the effect of head or tail winds upon the attitude of the boat.

4,091,762

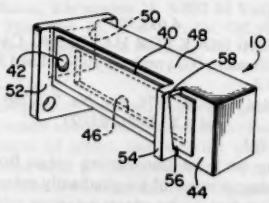
AUDIBLE VIBRATORY REED ASSEMBLY

William E. Ruehl, Wheeling, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Sep. 20, 1976, Ser. No. 724,494

Int. Cl.[2] G01L *19/12;* **G08B** *3/00*

U.S. Cl. 116—70 **22 Claims**



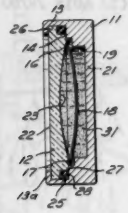
1. An audible vibratory reed assembly including a housing, a plate-like member having an aperture passing there-through forming a wall of at least one chamber in said housing, a flat reed having elongated side edges and fixed at one narrow end to said plate-like member, the plane of said reed at its fixed end forming an acute angle with the plane of said plate-like member and defining a normal state of rest, said reed adapted to cover a substantial portion of said aperture with its free extension when activated to vibrate by a pressure differential on opposite sides of said plate-like member and means spaced from said fixed one end and adapted to engage a point along one elongated edge of said reed for biasing said reed by angularly distorting said reed from its normal state of rest.

4,091,763

TEMPERATURE INDICATOR

Harold F. Snider, Mansfield, Ohio, assignor to Therm-O-Disc Incorporated, Mansfield, Ohio

Filed Jan. 5, 1977, Ser. No. 756,812
Int. Cl.[2] G01K 5/68
U.S. Cl. 116—114.5 16 Claims



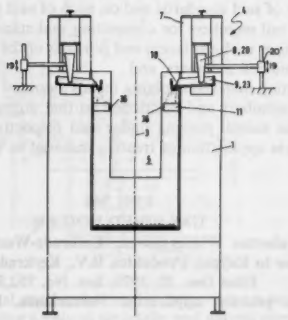
1. A visual temperature indicator comprising housing assembly defining a chamber and providing a transparent window, a shallow curved dished shaped bimetal snap disc in said chamber movable between two positions of stability and opposite curvature in response to predetermined temperatures, said disc being located adjacent to said window in one of said positions of stability and paced therefrom in the other of said positions of stability, said window being formed with a shallow concaved inner surface substantially fitting the curvature of said disc when said disc is in said one position and visual control means permitting said disc to be visible through said window when said disc is in said one position of stability and obscuring said disc from view through said window when said disc is in said other position of stability.

4,091,764

APPARATUS FOR UNIFORMLY COATING OBJECTS WITH PARTICLES

Hugo Brennenstuhl, Seestr. 1-3, Tubingen-Pfrondorf, Germany

Filed Sep. 27, 1976, Ser. No. 727,555
Claims priority, application Germany, Sep. 30, 1975, 2543575
Int. Cl.[2] B05B 5/02
U.S. Cl. 118—621 11 Claims



1. Apparatus for coating objects with particles comprising a feeding section and a coating section,

said feeding section including a movable feeder box, a means connected to said feeder box to vibrate same, a gravity duct, a conveyor channel, a means connected to said conveyor channel to vibrate same, and a shaped distributor body;

said coating section including a coating chamber, a means for removing unused particles from said coating chamber, and a delivery means for removing coated objects from said coating chamber;

said movable feeder box including an inclined bottom wall and an end section having an opening therein, said bottom wall being inclined towards said opening in said end section to convey particles in said feeder box towards said opening;

said means connected to said feeder box to vibrate same being connected to said bottom wall thereof;

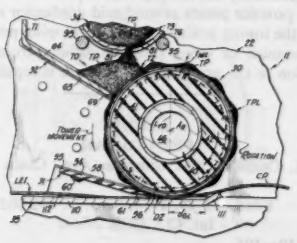
said gravity duct being generally vertically positioned to deliver particles passing through said opening in said end section of said feeder box to said conveyor channel, said conveyor channel extending at a right angle with respect to the particle feed direction through said gravity duct, said gravity duct being adjustable with respect to said opening in said end section of said feeder box, and said conveyor channel feeding particles into said shaped distributor body.

4,091,765

DEVELOPING AND FUSING APPARATUS

Ernest C. Lowthorp, deceased, late of Stone Mountain, Ga. (by Vivian L. Lowthorp, executrix); Frances T. Arnold, Atlanta, Ga.; Luther R. Winters, Jr., and Roy Lippert, both of Orlando, Fla., assignors to Vivian L. Lowthorp, Stone Mountain, Ga.

Filed Feb. 17, 1977, Ser. No. 769,441
Int. Cl.[2] G03G 15/09
U.S. Cl. 118—658 15 Claims



1. Developer apparatus for applying a single component magnetically responsive dry particulate toner powder to a latent electrostatic image on electrostatic copy paper moving along a prescribed paper path comprising:

a support frame;

an applicator roll assembly mounted on said support frame having a roll central axis oriented generally normal to the prescribed paper path; said applicator roll assembly including a cylindrical permanent magnet core concentric about said roll central axis and having circumferentially spaced, alternating polarity, permanent magnet poles on the periphery thereof extending along the length thereof generally parallel to said roll central axis, and a non-magnetic sleeve member concentrically mounted about said permanent magnet core and said roll central axis, said sleeve member having an inside diameter larger than the outside diameter of said permanent magnet core, and said sleeve member and said permanent magnet core rotatable relative to each other about said roll central axis so that said permanent magnet poles move around the inside of and closely adjacent to said sleeve member to generate a magnetic field around the outside of said sleeve member;

a paper guide member mounted on said support frame adjacent a prescribed circumferential developing position on said sleeve member so that the copy paper passes between said sleeve member and said paper guide member as it moves along the prescribed paper path, said paper guide member positioning the copy paper closely adjacent said

sleeve member at the developing position as the copy paper passes thereby;

supply means for supplying the toner powder to the periphery of said sleeve member at a prescribed toning position circumferentially shifted with respect to said developing position;

drive means operatively connected to said applicator roll assembly for effecting relative rotation between said permanent magnet core and said sleeve member to cause the toner powder to move around said applicator roll assembly past said developing position;

an electrically non-conductive primary doctor blade mounted on said support frame and defining a primary doctor edge thereon, said doctor edge oriented generally normal to the paper path and closely adjacent the periphery of said sleeve member so that the toner powder being magnetically moved around said applicator roll assembly passes between said primary doctor edge and said sleeve member to control the amount of the toner powder passing thereby, said primary doctor edge further located closely adjacent said developing position to accurately control the amount of toner powder exposed to the latent electrostatic image on said copy paper at said developing position for transfer from said sleeve member to the latent electrostatic image on the copy paper; and,

a secondary doctor blade mounted on said support frame and defining a secondary doctor edge thereon, said secondary doctor edge oriented generally normal to the paper path and closely adjacent the periphery of said sleeve member so that the toner powder passes between said secondary doctor edge and said sleeve member as the toner powder passes around said applicator roll assembly from the toning position to the developing position so that the amount of toner powder passing from the toning position to the primary doctor blade is regulated.

4,091,766

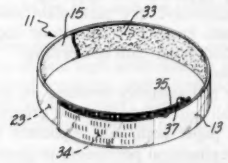
PET COLLAR

Lynette K. Colliard, 3061 Gibralter Ave., Costa Mesa, Calif. 92626

Filed Jul. 29, 1974, Ser. No. 492,602

Int. Cl.[2] A01K *27/00*

U.S. Cl. 119—106 **12 Claims**



1. A collar for attachment to the neck of an animal comprising:

an elongated sheath adapted to embrace the neck of the animal, said sheath having first and second sides, at least a portion of said first side being capable of passing light, said sheath having longitudinally spaced regions;

means for releasably connecting the spaced regions of the sheath to permit the sheath to be formed into a loop with the first side facing outwardly and the second side facing inwardly whereby the sheath can be releasably affixed to the neck of the animal;

reflective means for reflecting light, said reflective means being within said sheath and protected by said sheath, said reflective means facing said first side whereby light passing through said first side is reflected through said first side to thereby signal the presence of the animal;

absorbent material; and

means for mounting the absorbent material on said second side of said sheath with the absorbent material being on the exterior of said sheath.

4,091,767

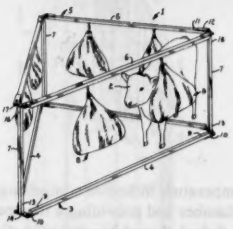
TREATING MATERIAL APPLICATOR FOR LIVESTOCK

Ronald R. Montgomery, Council Grove, Kans., assignor to Dust Rack, Inc., Kansas City, Mo.

Filed Oct. 26, 1976, Ser. No. 735,836

Int. Cl.[2] A01K *29/00*

U.S. Cl. 119—157 **5 Claims**



1. An applicator for applying treating material to animals upon actuation thereof by an animal, comprising:

(a) a plurality of elongated base members each having opposite end portions, said base members being arranged so that each end portion thereof is adjacent a respective end portion of an other base member;

(b) a plurality of standards each positioned between adjacent end portions of a respective two of said base members, said standards each having an upper end portion and a lower end portion;

(c) connection means on the lower end portion of each of said standards and on each of the end portions of said base member for connecting said standard lower end portions to the adjacent end portions of the respective two of said base members;

(d) a plurality of elongated rail members each having opposite end portions, said rail members being arranged so that each end portion thereof is adjacent a respective end portion of an other base member, each of said rail members being above a respective one of said base members a distance to permit an animal to walk thereunder

(e) second connection means on the upper end portion of each of said standards and on each of said end portions of said rail members for connecting said standard upper end portions to the adjacent end portions of the respective two of said rail members; and

(f) treating material applying means mounted on each of said rail members and positioned so that engagement thereof by an animal moving under said respective rail member effects application of treating material to the animal.

4,091,768

GAS-FIRED BOILER

Louis Hubertus Widdershoven, Kerkrade-West, Netherlands, assignor to Raypak Produkten B.V., Kerkrade, Netherlands

Filed Dec. 20, 1976, Ser. No. 752,550

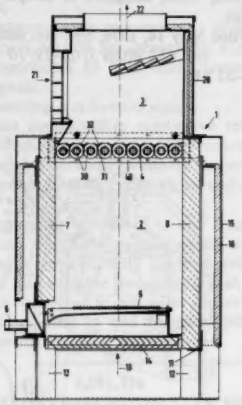
Claims priority, application Netherlands, Dec. 22, 1975, 7514926

Int. Cl.[2] F22B *37/10*; F28F *9/06*

U.S. Cl. 122—367 C **6 Claims**

1. In a gas-fired boiler which includes a combustion space having vertical insulating walls, a burner bed at the bottom of said combustion space for combusting the gas, a flue above said combustion space for connection to a chimney, and a bank of copper finned tubes arranged between said flue and said combustion space, said tubes being disposed substantially horizontally in heat-exchange relationship, and extending on opposite ends through respective tube plates into respective water head-

ers, with a gasket arranged under compression between each said header and an outer surface of the adjacent one of said tube plates around each tube end, each said header being symmetrical about a plane of symmetry, the improvement wherein



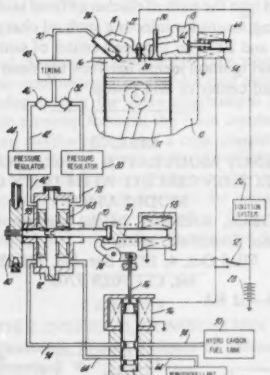
openings in each said plate and in each said header for allowing passage of each said tube end are arranged asymmetrically, in the direction of said burner bed, with respect to said plane of symmetry.

4,091,769

NON-AIR BREATHING OPTION FOR AN INTERNAL COMBUSTION ENGINE

Richard J. Baldwin, 31 Sagamore Trail, Sparta, N.J. 07871

Filed Feb. 25, 1977, Ser. No. 771,878
Int. Cl.[2] F02B *45/00*
U.S. Cl. 123—1 A **6 Claims**



1. In an internal combustion engine comprising a piston-cylinder means having a valved air intake and valved combustion products exhaust; means for injecting hydrocarbon fuel into the cylinder; spark ignition means for igniting the air-fuel mixture in the cylinder; said fuel injecting means comprising a hydrocarbon fuel tank, an engine-driven fuel pump connected to said tank, a pressure-responsive injector delivering the pump output to the cylinder; and timing means for cyclically disconnecting the injector from the pump:

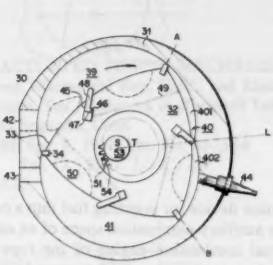
the improvement comprising a monopropellant fuel tank; a monopropellant pump for delivering propellant from its tank to the aforementioned timing means; a fuel selectro valve having a first normal run position wherein the hydrocarbon fuel pump communicates with the hydrocarbon fuel tank, and a second emergency position wherein the propellant pump communicates with the propellant tank; and an air cut-off valve for closing the cylinder air intake only while the selector valve is in its emergency position.

4,091,770

ROTARY ENGINE

Satoshi Suzuki, Chiba, Japan, assignor to Suzuki Industry Co., Ltd., Chiba, Japan

Filed Nov. 26, 1975, Ser. No. 635,358
Claims priority, application Japan, Nov. 28, 1974, 49-135840
Int. Cl.[2] F02B *53/00*
U.S. Cl. 123—242 **2 Claims**



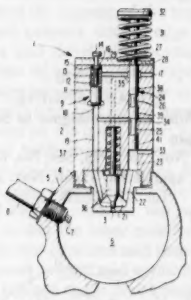
1. A rotary engine comprising a rotor housing having a trochoidally curved inner wall, a fuel suction port, and an exhaust gas discharge port, and a rotor having an outer wall with three apexes and mounted for eccentrically rotating about a central shaft, said rotor including seal pieces respectively mounted to the apexes of the rotor and sliding along the inner wall of the rotor housing to define three combustion chambers, three mounting holes each having a bottom portion and being inclined in the direction of rotation of the rotor and respectively positioned at the bisector of a straight line joining two adjacent apexes of the rotor, said bisector extending through the center of the rotor and intersecting with the outer wall of the rotor, three seal elements each respectively slidably arranged in the mounting hole, having a semi-spherical top portion, and serving to divide the combustion chamber under the compression-explosion stroke into a compression section and an explosion section, gas passageways respectively connecting the bottom portion of each mounting hole with the combustion chamber located in front of the respective apex ahead of the respective mounting hole to thereby permit the respective seal element to be pushed outwardly by compressed gas in the respective combustion chamber during the compression-explosion stroke of the engine, and recesses each formed on that portion of the outer wall of the rotor at which is formed the explosion section, thereby rendering the volume of the explosion far larger than that of the compression section, said rotor housing including an ignition plug for igniting the air-fuel mixture in the explosion section of the combustion chamber.

4,091,771

INJECTION DEVICE FOR INJECTING AN ADDITIONAL, SMALL FUEL QUANTITY INTO AN EXTERNAL AUTO-IGNITION INTERNAL COMBUSTION ENGINE OPERATING ACCORDING TO THE STRATIFIED-CHARGE PRINCIPLE

Wolfgang Rapp, Esslingen, and Dieter Schmidt, Stuttgart, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed May 12, 1975, Ser. No. 576,445
Claims priority, application Germany, May 22, 1974, 2424800
Int. Cl.[2] F02B *19/10, 19/16*
U.S. Cl. 123—32 SP 21 Claims



1. Injection device for injecting fuel into a combustion space such as an auxiliary combustion space of an external auto-ignition internal combustion engine of the type operating on a stratified-charge principle; said injection device comprising:

an injection device housing,

at least one fuel chamber provided in said housing for accommodating a quantity of fuel,

means for supplying fuel to said at least one fuel chamber,

a small diameter pump plunger movably displaceable in said housing for controlling a throughflow of fuel through the at least one fuel chamber and for raising the pressure of said fuel, said small diameter pump plunger being displaceable from an upper position to a lower dead center position,

a nozzle for communicating the fuel in said at least one fuel chamber to an auxiliary combustion space, and

means for regulating the quantity of fuel to be injected by the injection device including:

means for controlling an inlet pressure of the fuel supplied to said at least one fuel chamber by said fuel supplying means, and

a spring loaded variable volume fuel storer means separate from said pump plunger and said nozzle and located in said housing for storing fuel in said housing during at least part of the raising of the pressure of said fuel by said pump plunger, said spring loaded variable volume storer means being regulated by an initial fuel pressure such that an amount of fuel to be injected through the injection device is metered between a maximum quantity and a zero quantity, and

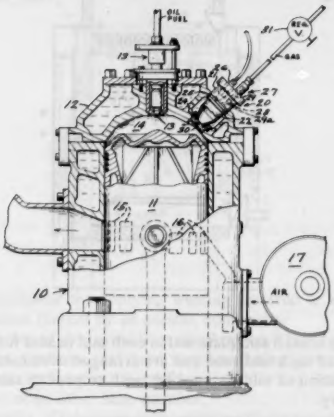
wherein, in the lower dead center position of the pump plunger, fuel passes through said at least one fuel chamber to cool the nozzle and to prevent fuel vapor lock.

4,091,772

INTERNAL COMBUSTION ENGINE WITH DELAYED TORCH IGNITION OF OIL FUEL CHARGE

William R. Heater; Fred S. Schaub, and John R. Kennedy, all of Mount Vernon, Ohio, assignors to Cooper Industries, Inc., Houston, Tex.

Filed May 14, 1976, Ser. No. 686,279
Int. Cl.[2] F02B *3/02, 19/10*
U.S. Cl. 123—32 SP 6 Claims



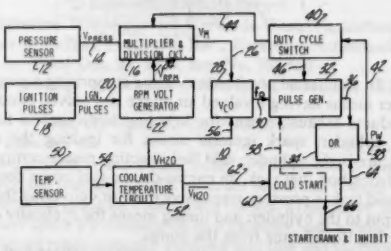
1. An internal combustion engine comprising, in combination, a cylinder having a cylinder head, a piston positioned within said cylinder, a first chamber defined by said head and said piston, means for filling said cylinder with a charge of air for combustion, a second chamber in communication with said first chamber, means for introducing a charge of fuel into said second chamber, means for igniting such charge in said second chamber, means for injecting a charge of oil into said first chamber and into the path of discharge from said second chamber and timing means for injecting such oil charge between top dead center and 20° after top dead center of said piston and for activating said ignition means between top dead center and 10° after top dead center of said piston.

4,091,773

FREQUENCY MODULATED SINGLE POINT FUEL INJECTION CIRCUIT WITH DUTY CYCLE MODULATION

Rajamouli Gunda, Rochester, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Oct. 4, 1976, Ser. No. 729,250
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—32 EA 32 Claims



1. A frequency modulated fuel injection system for internal combustion engines comprising:

pressure sensing means for measuring the manifold pressure of the engine and generating a pressure electrical signal representing said manifold pressure;

means responsive to the rotational speed of the engine and generating a speed electrical signal representing said rotational speed;

function generating means responsive to said pressure and speed electrical signals for generating a control signal directly proportional to both said pressure and speed electrical signals;

means for generating a reference signal;

oscillator means connected in responsive relation to said function generating means and said reference signal generating means for generating a variable frequency electrical signal in response to said control signal and said reference signal;

pulse generator means connected to said frequency modulated electrical signal for generating an electrical pulse signal having a variable duty cycle in response to the frequency of said variable frequency signal; and

injection means connected to said pulse generator means and operative in response to said electrical pulse signal for supplying the fuel demand to the engine.

4,091,774

STRATIFIED COMBUSTION TYPE ENGINE

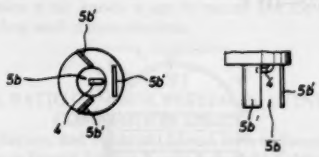
Minoru Kamiya, 2–46–3, Minami Otsuka Toshima Ku, Tokyo, Japan

Division of Ser. No. 529,512, Dec. 4, 1974, Pat. No. 4,019,473. This application Dec. 22, 1976, Ser. No. 753,266

Claims priority, application Japan, Dec. 5, 1973, 48-135345; Dec. 5, 1973, 48-135346

Int. Cl.[2] **F02B** *19/10*

U.S. Cl. 123—32 ST **4 Claims**



1. A stratified combustion type engine comprising an engine cylinder, a main combustion chamber located above the cylinder, a spark plug within the main combustion chamber, an injection nozzle directed towards the main combustion chamber for injecting auxiliary fuel, and a cage consisting of a plurality of vertical members at intervals surrounding the spark plug tip and having a wide interval aligned with the nozzle, the cage being projectingly installed within the main combustion chamber in the path of auxiliary fuel flow from the injection nozzle for holding and vaporizing the flow of fuel from the nozzle.

4,091,775

TWO-STROKE INTERNAL COMBUSTION ENGINE

Rémi Curtil, Eaubonne, France, assignor to Motosacoche S.A., Geneve, Switzerland

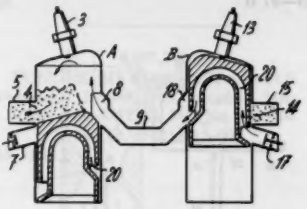
Filed Mar. 28, 1977, Ser. No. 782,030

Claims priority, application Switzerland, Mar. 31, 1976, 3987/76

Int. Cl.[2] **F02B** *75/20, 33/04*

U.S. Cl. 123—59 BM **5 Claims**

1. In a two-stroke internal combustion engine comprising at least one group of two alternately-operating cylinders each cylinder housing a piston and defining, with the piston, a combustion chamber, each combustion chamber having exhaust means and an intake port, the improvement comprising : a conduit connecting the two combustion chambers, said conduit having two ends leading into the respective intake ports of the two combustion chambers, said intake ports being arranged to be temporarily simultaneously uncovered by their pistons to provide a temporary communication of the two combustion chambers; and means in each cylinder, opposite the combustion chamber in relation to the piston, for the intake of cool gas; each piston having a skirt and means defining in the skirt, at an angular location aligned with said intake port of the respective combustion chamber, an opening which, in operation, when the respective piston approaches a top dead center position faces said intake port for the delivery of cool gas from



the intake means of its cylinder via said conduit to scavenge the combustion chamber of the other cylinder; whereby when in operation, said piston moves down from said top dead center position and uncovers its intake port, the residual energy of exhaust gases of said combustion chamber supercharges cool gases delivered to the other combustion chamber and then actuates scavenging of its own combustion chamber via its exhaust means.

4,091,776

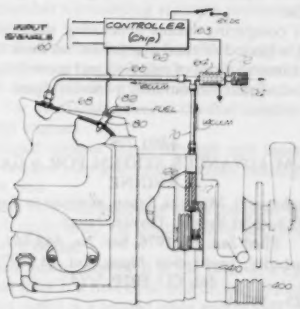
FLUID ACTUATED TIMING MECHANISM

James D. Clemens, Marina del Rey, Calif., and Elmer A. Williams, San Angelo, Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 4, 1974, Ser. No. 457,954

Int. Cl.[2] **F01L** *1/34, 1/24*

U.S. Cl. 123—90.15 **16 Claims**



1. In an internal combustion engine having an intake manifold, a crank shaft, and a cam shaft, a fluid actuated timing mechanism comprising:

a drive member operatively connected for rotation with the crank shaft,

a driven member operatively connected with the cam shaft, whereby relative displacement of said drive member and said driven member rotationally displaces the engine cam shaft relative to the engine crank shaft,

vacuum responsive means to relatively displace said drive member and driven member,

a line connecting the intake manifold to said vacuum responsive means, and

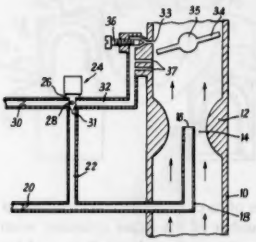
vacuum control means in said line for controlling application of vacuum to said vacuum responsive means.

4,091,777

ELECTRONIC CONTROL CIRCUIT FOR A CARBURETOR DEVICE

Louis Monpetit, Foncquevillers, and Gilbert Hamelin, Marly la Ville, both of France, assignors to Societe Anonyme D.B.A., Paris, France

Filed Apr. 2, 1976, Ser. No. 673,027
Claims priority, application France, Apr. 11, 1975, 75 11480
Int. Cl.[2] F02D *31/00;* F02M *23/04;* F02D *11/10*
U.S. Cl. 123—97 B 17 Claims



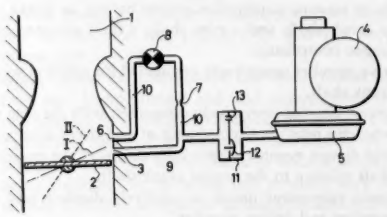
1. In carburetor comprising an idle and low speed circuit:
a control valve mounted in said circuit for controlling admission of fuel-air mixture in said circuit;
first means for generating a control signal for controlling said valve to modulate admission of said fuel-air mixture;
said first means for generating a control signal being responsive to a first signal whose level is representative of the relative variations between the durations of two engine cycles for generating a control signal whose duration decreases as a function of the level of said first signal;
said control valve being adapted to be closed upon generation of said control signal;
said first means for generating said control signal comprising first comparing means for comparing said first signal with a second signal, said second signal being substantially periodic;
said first comparing means generating said control signal during a period of time comprised between the first and second intersections of said first and second signals within a period of said substantially periodic signal.

4,091,778

VACUUM ADVANCER SYSTEM FOR A GASOLINE ENGINE

Keiichi Okabayashi, Miyoshi, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jan. 15, 1976, Ser. No. 649,549
Claims priority, application Japan, Jul. 11, 1975, 50-85578
Int. Cl.[2] F02P *5/14*
U.S. Cl. 123—117 A 8 Claims



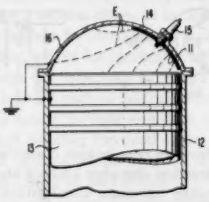
1. In a gasoline engine having a carburetor including a throttle valve and a distributor having a diaphragm chamber, an improved vacuum advancer system for controlling the ignition timing of the engine in response to an engine load, said vacuum advancer system comprising a first port formed in the wall of the carburetor, said first port being positioned upstream of the throttle valve relative to the intake flow when the throttle valve is in a first operating position of the engine at the time the throttle valve is set at the desired position thereof, said first port being positioned downstream of the throttle valve relative to the intake flow when the throttle valve is in a second operating condition of the engine at the time the throttle valve is opened a predetermined value; a second port formed in the wall of the carburetor, said second port being positioned upstream of the throttle valve relative to the intake flow when the throttle valve is in the position corresponding to the second operating condition of the engine, said second port being positioned downstream of the throttle valve when the throttle valve is in a third operating position at the time the throttle valve is opened a further predetermined value slightly beyond said first mentioned predetermined value; a first pipe connected between said first port and the diaphragm chamber; a second pipe connected between said second port and said first pipe; throttling means positioned in said second pipe; and heat sensitive valve means positioned in said second pipe whereby said second pipe communicates with said first pipe only after the engine has warmed up to a predetermined temperature.

4,091,779

METHOD AND APPARATUS FOR INFLUENCING THERMO-CHEMICAL REACTIONS

Helmut Säufferer, Esslingen, and Karl Willmann, Aichwald, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Nov. 28, 1975, Ser. No. 635,752
Claims priority, application Germany, Nov. 28, 1974, 2456163
Int. Cl.[2] F23B *7/00*
U.S. Cl. 123—119 E 36 Claims



1. A method for influencing thermo-chemical reactions by means of an electric field, comprising the step of directing the ions formed by the reaction itself, as opposed to ionizing of the reactant mixture, by applying the electric field in order to control the further reaction progress.

4,091,780

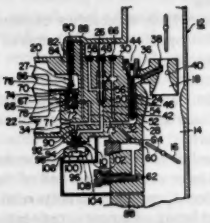
CAR KNOCK PREVENTIVE SYSTEM

Kenji Masaki, and Hidehiro Minami, both of Yokohama, Japan, assignors to Nissan Motor Company, Ltd., Japan

Filed Feb. 3, 1976, Ser. No. 654,743
Claims priority, application Japan, Feb. 7, 1975, 50-15456; Feb. 7, 1975, 50-15458
Int. Cl.[2] F02M *7/12*
U.S. Cl. 123—119 R 9 Claims

1. A car knock preventive system in combination with a carburetor for an internal combustion engine of a motor car, said carburetor including
an induction passageway through which air for combustion of fuel in a combustion chamber of an internal combustion engine passes,
a throttle valve rotatably mounted in the induction passageway,
a main venturi located in the induction passageway upstream of the throttle valve,

a fuel bowl containing liquid fuel therein,
a main fuel passage communicating with the fuel bowl and opening into the main venturi for providing a main air-fuel mixture for the engine,
an idle and low speed running fuel passage diverging from the main fuel passage and opening into the induction passageway downstream of the throttle valve in its open position for providing an idle and low speed running air-fuel mixture for the engine, and
first and second air bleeds each of which communicates with



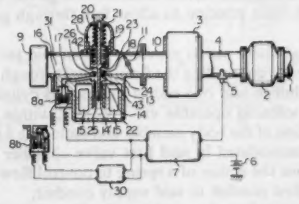
the idle and low speed running fuel passage and with the atmosphere, said car knock preventive system comprising
a flow control valve for obstructing communication of the diverging point of the idle and low speed running fuel passage from the main fuel passage with the atmosphere by way of at least one of the first and second air bleeds for reducing the amount of air drawn from said at least one air bleed into the main venturi by the vacuum therein in response to an operating condition of the engine at which condition a car knock is apt to occur and for normally providing said communication.

4,091,781

AIR-FUEL RATIO CONTROL SYSTEM IN AN INTERNAL COMBUSTION ENGINE

Masaki Mituyasu, and Takatoshi Masui, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Oct. 4, 1976, Ser. No. 728,903
Claims priority, application Japan, Jun. 10, 1976, 51-67049
Int. Cl.[2] F02M *7/00, 7/02*
U.S. Cl. 123—119 EC **4 Claims**



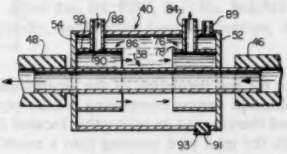
1. In combination with an internal combustion engine having an air fuel ratio feedback control system comprising; at least two carburetors each including a main nozzle, a venturi through which the suction air from an air cleaner passes, an air bleed passage, and an electromagnetic valve means arranged in said air bleed passage for regulating the quantity of the bled air; a common oxygen sensor installed in an exhaust manifold of said engine for detecting the concentration of oxygen in the exhaust gas; and a control unit which is connected to said oxygen sensor and in which the measurement by said oxygen sensor is compared with a predetermined standard, each said electromagnetic valve means being connected to said oxygen sensor through said control unit and being operated to repeatedly open and close with a frequency produced by an output pulse from said control unit, wherein the pulse width of said output pulse during which said valve means continues to be opened is changed, where there is a difference between said measurement and said standard by said control unit in response to said difference; wherein the improvement comprises a phase difference control unit interposed between said control unit and at least one of said electromagnetic valve means for producing a phase difference between said output pulses supplied to said at least two electromagnetic valve means from said control unit.

4,091,782

FUEL PREHEATING APPARATUS

Barnabas Dunnam, C.B. Box 1701, Lucedale, Miss. 39452

Filed Jun. 30, 1976, Ser. No. 701,424
Int. Cl.[2] F02M *31/00*
U.S. Cl. 123—122 E **5 Claims**



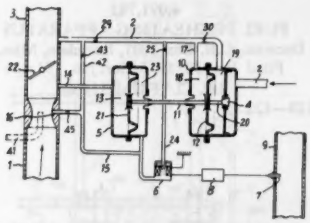
1. A fuel preheating apparatus for use with an internal combustion engine having a closed liquid coolant circuit including a coolant conduit through which heated liquid coolant flows and having a fuel storage tank having a fuel conduit for delivering fuel to the engine, said apparatus comprising:
an inner chamber formed of heat conductive material,
said inner chamber including a coolant inlet coupled to the coolant conduit for receiving heated liquid coolant from the coolant conduit, and a coolant outlet coupled to the coolant conduit for discharging liquid coolant to the coolant conduit; and
an outer chamber surrounding at least a portion of said inner chamber,
said outer chamber including a fuel inlet coupled to the fuel conduit for receiving fuel from the fuel storage tank via the fuel conduit, and a fuel outlet coupled to the fuel conduit for discharging fuel to the fuel conduit for delivery to the engine,
whereby liquid coolant flows through said inner chamber via said coolant inlet and outlet, thereby heating said inner chamber, and
whereby fuel flows through said outer chamber via said fuel inlet and outlet and, via contact with said heated inner chamber, is heated,
wherein said inner chamber is in the form of a cylinder
said coolant inlet is a first open end of said cylinder, and
said coolant outlet is a second open end of said cylinder,
wherein said outer chamber is in the form of a cylinder concentrically surrounding at least a portion of said inner chamber,
said outer chamber cylinder having a first end plate with an aperture therein receiving said inner chamber and having a diameter substantially equal to the outer diameter of said inner chamber, and having a second end plate with an aperture therein receiving said inner chamber and having a diameter substantially equal to the outer diameter of said inner chamber, and
further including an intermediate open-ended cylinder concentrically surrounding a portion of said inner chamber within said outer chamber, said intermediate cylinder having a diameter greater than said inner chamber diameter, and having one end in contact with said outer chamber second end plate, and
a tube interconnecting the interior of said intermediate cylinder and said outer chamber fuel outlet.

4,091,783

DEVICE FOR THE REGULATION OF THE FUEL-AIR MIXTURE OF AN INTERNAL COMBUSTION ENGINE

Bernard R. Laprade; Xavier J. Laprade, both of 64260 Arudy, and Pierre J. Gelé, 3, rule Vaussenat, Tarbes, all of France

Filed Jun. 7, 1976, Ser. No. 693,729
Claims priority, application France, Jun. 18, 1975, 75 19076
Int. Cl.[2] F02M 23/04
U.S. Cl. 123—124 B 16 Claims



1. A device for the regulation of the air-fuel mixture of an internal combustion engine comprising a inlet pipe having a venturi located therein, and an inlet valve located downstream of the venturi, the inlet pipe opening into a manifold, and an exhaust pipe, the device comprising:

first and second capsules, each divided into first and second chambers by an element which is movable in said capsules in response to a pressure difference between said first and second chambers,

the first and second chambers of said first capsule being subject respectively to the static and dynamic pressures prevailing in the inlet pipe upstream of the inlet valve, and the first and second chambers of said second capsule being subject to the pressure prevailing in the manifold,

a connecting element connecting said movable elements,

a gas inlet to the manifold,

a control valve arranged in said gas inlet and connected to said movable elements,

a probe arranged in the exhaust pipe for detecting the composition of the exhaust gases, and

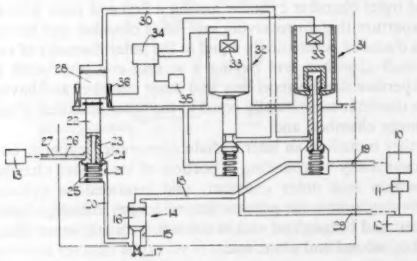
an electromagnetic valve for altering the pressure in one of the four capsule chambers in response to the composition of the exhaust gases.

4,091,784

FUEL INJECTION SYSTEMS FOR INTERNAL COMBUSTION ENGINES

Alec Harry Seilly, and Paul Lakra, both of Wembley, England, assignors to Lucas Industries Limited, Birmingham, England

Filed Sep. 8, 1976, Ser. No. 721,601
Claims priority, application United Kingdom, Sep. 19, 1975, 38493/75
Int. Cl.[2] F02D 5/02
U.S. Cl. 123—139 AT 5 Claims



1. A fuel injection system for supplying fuel to an internal combustion engine, comprising a body member adapted to be secured to the engine and including a reduced end portion and an enlarged portion having a first part which is integral with the reduced end portion and a second part which is secured by bolts to said first part, said body member defining:

a first cylinder formed in said reduced end portion and having a seating and an outlet orifice at one end;

a first inlet opening for connection to a source of fluid under pressure;

a second inlet opening for connection to a source of fuel under pressure;

a drain opening;

a first conduit which establishes communication between said first inlet opening and that end of said first cylinder which is opposite said one end;

a second cylinder;

a further conduit which establishes communication between one end of said second cylinder and said one end of the first cylinder;

a fuel inlet conduit for establishing communication between said second inlet and said one end of the second cylinder;

a third cylinder disposed coaxially relative to the second cylinder and being of larger cross-sectional area than said second cylinder;

first and second valve chambers formed in said first part and connected with the first conduit and the drain opening respectively; and

a supply conduit for establishing communication between that end of said third cylinder which is remote from said second cylinder and both said first and second valve chambers, and the system further comprising:

a stepped valve member slidable within said first cylinder and having a narrow end portion and a wide end portion, said narrow end portion cooperating with said seating to control flow of fuel through said outlet orifice to a combustion space of the engine, said wide end portion presenting a first working surface at that end of the wide end portion which is remote from said narrow end portion and a second working surface which surrounds the narrow end portion at that end thereof which is nearer said wide end portion, said first working surface being subject to fluid pressure communicated from said first inlet opening to said first cylinder by way of said first conduit to urge the valve member to a closed position in which the valve member contacts the seating and the second working surface being subject to pressure of fuel communicated to said one end of the first cylinder from said second cylinder by way of said further conduit to urge the valve member to an open position to allow fuel through said outlet orifice;

a displacement piston movable within said second cylinder;

a valve for controlling the flow of fuel through said fuel inlet conduit to said one end of the second cylinder;

a first solenoid operable valve located within said enlarged portion of the body member and including a valve element accommodated in said first valve chamber and movable against the action of a spring to control flow of fluid from the first conduit to said supply conduit;

a second solenoid operable valve located within said enlarged portion of the body member and disposed in spaced, substantially parallel relationship with respect to said first solenoid operable valve and including a valve element accommodated in said second valve chamber and movable against the action of a spring to control flow of fluid from the supply conduit to the drain opening;

an operating piston located in said third cylinder, the operating piston having a larger area than the displacement piston so that when the first solenoid operable valve is open and the second solenoid operable valve is closed, fluid pressure is applied to the operating piston by way of the first inlet opening, the first conduit, the first valve chamber and the supply conduit and the displacement piston is moved by the operating piston to generate a fuel pressure to act on the second working surface of the

stepped valve member, whereas when the first solenoid operable valve is closed and the second solenoid operable valve is open, the displacement piston and the operating piston are permitted to move in the second and third cylinders respectively under the action of fuel flowing into said second cylinder through said fuel inlet conduit;

sensing means mounted within the body part for sensing the extent of movement of the operating piston; and

a control circuit to which a signal from said sensing means is supplied for controlling operation of said first and second solenoid operable valves, each of first and second solenoid operable valves including an annular armature accommodated in said second part of said enlarged portion and engaging the valve element, and a solenoid accommodated in said second part of said enlarged portion and comprising an annular core positioned within the armature, the cores of the first and second solenoid operable valves being connected to respective support portions which are secured to said second part of said enlarged portion, the side walls of the armatures and cores that are respectively presented to each other being formed each with a thread formation to define respective helical ribs on the armatures and the cores, and said cores carrying windings whereby when either of said solenoid operable valves is actuated by supplying electric current to its winding, relative axial movement takes place between the rib on the core of the valve and the rib on the armature of the valve, thereby to actuate the valve element of the valve.

4,091,785

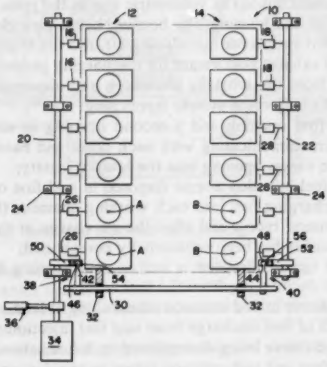
FUEL CONTROL CROSS SHAFT

Alvin W. Montgomery, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 19, 1976, Ser. No. 706,715

Int. Cl.[2] F02D *1/04*

U.S. Cl. 123—140 R **6 Claims**



1. In an internal combustion engine comprising a pair of pluralities of equal numbers of cylinders with said pairs of pluralities of cylinders being aligned side by side, and including a fuel injector pump for each of said cylinders, an improved system for controlling each of said pumps to operate simultaneously and to deliver a generally equal amount of fuel to each respective cylinder, comprising:

a pair of control shafts, one aligned parallel to each of said pairs of pluralities of cylinders generally perpendicular to the axes of each of said cylinders and spaced laterally therefrom;

a pair of pluralities of fuel injector pump control link means, each of said pairs of pluralities of link means being movable responsive to rotation of a respective one of said control shafts, each of said link means controlling fuel injection from a respective one of said pumps to a respective corresponding cylinder;

a cross shaft extending from adjacent a respective one of said control shafts to adjacent a respective other thereof, and mounted to rotate about a longitudinal axis thereof;

means for controlling rotation of said cross shaft about a longitudinal axis thereof; and

means communicating said cross shaft with each of said control shafts to cause an equal rotation of each of said control shafts about a longitudinal axis thereof responsive to a rotation of said cross shaft and about a longitudinal axis thereof.

4,091,786

DEVICE FOR REGULATING FUEL INTAKE OF INTERNAL COMBUSTION ENGINES

George Albert Hartopp, Leicester, England, assignor to John Albert Hartopp and Rita Alberta Jones, both of Leicester, England

Filed Jan. 31, 1977, Ser. No. 763,918

Claims priority, application United Kingdom, Feb. 3, 1976, 4206/76

Int. Cl.[2] F02M *29/00*

U.S. Cl. 123—141 **5 Claims**

1. A flow regulating device for insertion in an air fuel intake pipe of an internal combustion engine, comprising sheet metal support, a number of cut-out portions in the support defining, for the support, a peripheral mounting portion, an annular central portion, a central aperture in the central portion and web portions between the mounting portion and the central portion,

a metal gauze sheet overlying the sheet metal support and the cut-out portions therein said gauze sheet being in close contact with said web portions for selective masking by said web portions,

means securing the metal gauze sheet to the sheet metal support, and

a central aperture in the metal gauze sheet coincident with the central aperture in the sheet metal support said apertures providing a free and uninterrupted air passage through the device.

4,091,787

IGNITION DEVICE FOR INTERNAL COMBUSTION ENGINES

Gunter Frank, Bensheim, Germany, assignor to Kyberna GmbH, Bensheim, Germany

Filed Jul. 6, 1976, Ser. No. 702,768

Claims priority, application Germany, Jul. 3, 1975, 2529724

Int. Cl.[2] F02P *5/04, 1/00*

U.S. Cl. 123—148 E **9 Claims**

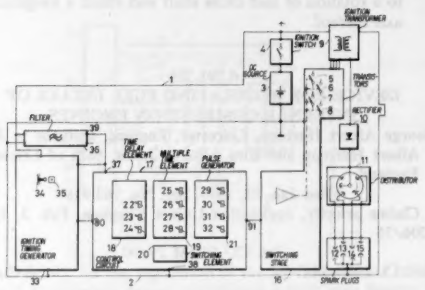
1. An ignition system for an internal combustion engine comprising timing means for providing a first output signal which is a function of the angular position of the crankshaft or of the position of a piston in a cylinder of said engine, a pulse generating control means responsive to said first output signal for providing switching signals, and a switching means responsive to said switching signals for connecting a DC voltage source to an ignition transformer, said timing means and pulse generating control means including means for varying the

beginning, end and duration of said switching signals, wherein the improvement comprises:

a pulse generating control means comprising

a switching element connected to the output of said timing means for providing a plurality of second output signals having different time durations in response to said first output signal,

a multiple time element including a plurality of first resistance-capacitance circuits for respectively coupling all



but one of said second output signals to a combining circuit, means for coupling said one of said second output signals to said combining circuit, and means for coupling said first output signal to said combining circuit, said combining circuit providing a third output signal having a shape which is a function of the signals combined, and

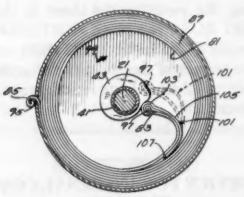
a pulse generator operative in response to the presence of said third output signal for generating said switching signals.

4,091,788

STARTER MECHANISM WITH OVERSPIN RESTRICTOR SHOE

Dennis N. Burmeister, Libertyville, and Adolph J. Yourich, Waukegan, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Feb. 17, 1976, Ser. No. 658,592
Int. Cl.[2] F02N *1/00*
U.S. Cl. 123—185 BA **5 Claims**



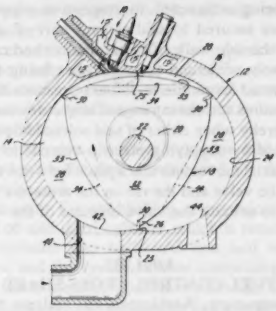
1. A starter mechanism comprising a housing member adapted to be fixed relative to an engine, a pulley having a side face and a peripheral groove, means mounting said pulley for rotation with respect to said housing member and with said side face in spaced generally parallel relation to said housing member so as to define a spring chamber, a coiled rewind spring located in said chamber, said spring having a plurality of convolutions, an inner end, and an outer end, means anchoring said outer end of said spring in fixed relation to said housing member, means anchoring said inner end of said spring to said pulley for common rotation of said inner end of said spring with said pulley at all times, a pull rope anchored to said pulley and wound in said groove, whereby withdrawal of said pull rope from said pulley causes rotation of said pulley in the direction which is effective to wind up said rewind spring and whereby, subsequent to withdrawal of said pull rope from said pulley and upon release of said pull rope, said spring serves to rotate said pulley in the opposite direction so as to rewind said pull rope in said groove and to unwind said rewind spring, and means mounted on said pulley for preventing overrunning of said pulley in the rewind direction.

4,091,789

STRATIFIED CHARGE FUEL INJECTION SYSTEM FOR ROTARY ENGINE

Charles Jones, Hillsdale, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Feb. 11, 1977, Ser. No. 767,820
Int. Cl.[2] F02B *53/10*
U.S. Cl. 123—205 **2 Claims**



1. In a rotary internal combustion engine having a housing forming a cavity in which a rotor is eccentrically supported for planetary rotation so as to form a plurality of working chambers defined between the rotor and housing which successively expand and contract in volumetric size as the rotor planetates relative to the housing, the housing being provided with an intake port means for introducing air into the working chambers and exhaust port means for discharging products of combustion from the working chambers, and improved stratified charge fuel injection system comprising:

(a) a first opening and a second opening in said housing intercommunicating with each other and having a common recess opening into the housing cavity;

(b) a fuel injection nozzle disposed in said first opening for discharging fuel into each working chamber through the common recess and after the air charge in the working chamber has been substantially compressed;

(c) an igniter disposed in said second opening for igniting fuel discharging from the fuel nozzle;

(d) a sleeve in said common recess along at least a part of the path of fuel discharge from said fuel injection nozzle; and

(e) said sleeve being dimensioned to define between its outer surface and said common recess an annular space and also having an annular groove in the outer surface thereof inwardly of the end of the sleeve and communicating with the space so that the sleeve retains heat and promotes vaporization of at least some of the fuel passing through said sleeve.

4,091,790

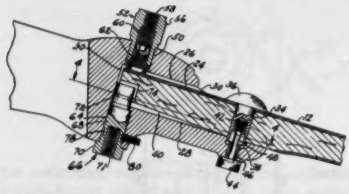
TAKE DOWN BOW WITH LIMB ADJUSTMENT MEANS

Earl H. Hoyt, Jr., 11510 Natural Bridge Rd., Bridgeton, Mo. 63044

Filed Feb. 16, 1977, Ser. No. 769,010
Int. Cl.[2] F41B *5/00*
U.S. Cl. 124—24 R **9 Claims**

1. In an archery bow, a handle section, upper and lower bow limbs and a bow string, means for pivoting the butt end por-

tions of said limbs on the ends of said handle section in a plane substantially in the plane including said bow limbs and bow string permitting for angular movement of said limbs lateral to the plane including the low and the bow string, and means rotatably mounted in said handle section near each end thereof



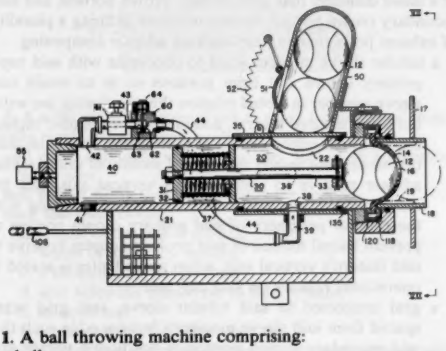
and spaced longitudinally inward from said pivoting means for engaging laterally opposed surfaces of the terminal end portions of the butt ends of said bow limbs for selectively angularly adjusting said limbs a plane generally perpendicular to the plane of the bow and bow string and for holding them in the angularly adjusted positions.

4,091,791

BALL THROWING MACHINE

Joseph Tom Castelli, and Joseph J. Forrester, both of Pittsburgh, Pa., assignors to Instrument Services, Inc., Bridgeville, Pa.

Filed Sep. 19, 1975, Ser. No. 614,880
Int. Cl.[2] F41B *11/02*
U.S. Cl. 124—73 **30 Claims**



1. A ball throwing machine comprising:
a ball;
a circular member formed of a resilient material having an off-center opening formed therethrough which opening is of a substantially smaller diameter than the ball to be thrown;
selector means for generating a selected spin on said ball; and,
propulsion means for forcing a ball through the offcenter opening of said circular member at a predetermined velocity and generating the selected spin on said ball as a function of the selector means.

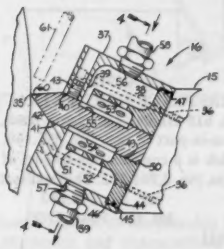
26. A pneumatic system for a ball throwing machine comprising:
air compressor means for compressing air;
an air reservoir connected to said air compressor means for storing compressed air;
regulator means disposed between said air compressor means and said air reservoir for setting the pressure of the air in said air reservoir;
a chamber within which balls to be thrown are positioned;
an air line connecting said air reservoir and said chamber; and
an interval timer valve disposed in said air line between said air reservoir and said chamber having an open position, permitting free communication between said air reservoir and said chamber, and a closed position, preventing pneumatic communication between said air reservoir and said chamber, being switchable between the closed and open position at preselected adjustable intervals.

4,091,792

GRINDING WHEEL DRESSER UNIT WITH IMPROVED HEAT TRANSFERRING CAPABILITY

Thomas Michael Farrell, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Mar. 25, 1977, Ser. No. 781,161
Int. Cl.[2] B24B *53/12*
U.S. Cl. 125—11 CS **7 Claims**



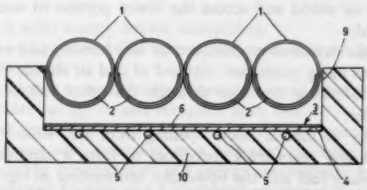
1. A grinding wheel dresser unit, comprising in combination:
(a) a dresser housing;
(b) a closed coolant fluid chamber within said housing;
(c) a diamond dressing nib supported upon the dresser housing;
(d) means for conducting heat from said nib to said coolant chamber at a conduction rate substantially greater than that of steel;
(e) a coolant fluid inlet port to the coolant chamber;
(f) a coolant fluid outlet port from the coolant chamber, said outlet port being in fluid communication with said inlet port through the coolant chamber;
(g) a closed conduit in fluid communication with the coolant chamber for transferring a coolant from a remote coolant source to said inlet port; and
(h) an outlet conduit received by said outlet port for directing the coolant away from the nib and the dresser housing.

4,091,793

SOLAR COLLECTOR

Wilhelm Hermann, and Horst Hörster, both of Roetgen, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 21, 1976, Ser. No. 678,868
Claims priority, application Germany, May 17, 1975, 2522160
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—270 **4 Claims**



1. A solar collector comprising an absorber for transferring heat from incident solar radiation to a transport medium, and a

heat-insulating transparent cover separating the absorber from the ambient atmosphere and consisting of a plurality of sealed and evacuated glass tubes adjacently arranged in contact with each other, at least the lower half of the inner surface of each glass tube being provided with an infrared-reflecting layer, the inner surface of each glass tube also being provided on the infrared-reflecting layer with a reflection-reducing layer satisfying the condition

$$n \cdot d = \lambda/4,$$

wherein

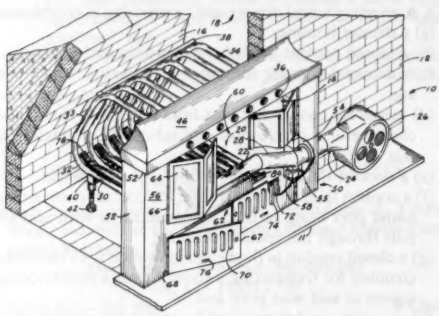
n = the refractive index of the reflection-reducing layer;
d = the thickness of the reflection-reducing layer; and
λ = 0.6 micron.

4,091,794

FIREPLACE HEAT EXTRACTOR

James J. Stites, 615 Hunter La., Santa Rosa, Calif. 95404

Continuation-in-part of Ser. No. 597,160, Jul. 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 494,027, Aug. 2, 1974, Pat. No. 3,901,212. This application Nov. 24, 1976, Ser. No. 744,693
Int. Cl.[2] F24B 7/00
U.S. Cl. 126—121 5 Claims



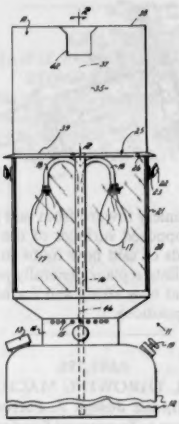
1. A fireplace heat extractor comprising:
an impervious air shield adapted to be supported on the hearth of a fireplace and having a flat bottom surface to engage said hearth, and having planar side and top surfaces of a size and shape to engage the face of a fireplace around the sides and top of the fireplace opening and block air movement thereinto;
limited capacity openings in the lower portion of said air shield;
manually operated damper means for said limited capacity openings;
a tubular, generally horizontal header extending through said air shield and across the lower portion of said air shield;
air intake means at an inlet end of said header, said intake means being positioned outward of said air shield;
means blocking flow out through the other end of said header;
an array of tubular ducts opening from said header and extending rearwardly therefrom to form a support for fireplace fuel and the upwardly, terminating in top portions extending forwardly through said air shield to open outwardly therefrom, so that air movement outward through said air shield confined to flow through said ducts.

4,091,795

COOKING ADAPTER

James W. Wells, 2140 Oleander Dr., Lexington, Ky. 40504

Filed Sep. 3, 1976, Ser. No. 720,134
Int. Cl.[2] F24C 5/04
U.S. Cl. 126—258 6 Claims



1. A cooking adapter for use with a gas fired lantern, said lantern including a cap mounted in an immobile position, said cap including a brim portion, a primary crown portion and a secondary crown portion, said secondary crown portion being of a lesser diameter than said primary crown portion, and said secondary crown portion having structure defining a plurality of exhaust ports therein, said cooking adapter comprising
a tubular sleeve member sized to cooperate with said cap's primary crown and brim portions so as to retain said sleeve member in seated relation thereon during use without being secured thereto, and said sleeve member including a bottom edge adapted to seat against said brim portion to prevent axially downward motion of said cooking adapter relative to said lantern's vertical axis, and the inside periphery of said sleeve member cooperating with the exterior periphery of said primary crown portion to prevent lateral motion of said cooking adapter relative to said lantern's vertical axis, when said adapter is seated in operational relation on said cap, and
a grid connected to said tubular sleeve, said grid being spaced from said sleeve member's bottom edge such that said secondary crown portion is positioned within said sleeve member but beneath said grid when said cooking adapter is seated in operational relation on said cap, and said grid being adapted to receive a cooking implement thereon in use.

4,091,796

SOLAR ENERGY COLLECTION APPARATUS

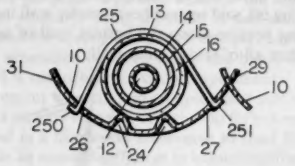
Robert J. Bieringer, and George R. Mather, Jr., both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 16, 1976, Ser. No. 714,724
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—270 16 Claims

1. The combination of
an elongated, tubular solar energy collector,
a shaped reflector of a relatively rigid material having a concave reflecting surface comprised of a specular reflecting layer thereon, said concave surface having a constant radius of curvature defining a segment of a cylinder smaller than a semi-cylinder,
plural, spaced, thin, resilient elements connected to the reflector at laterally spaced points thereon and encircling

the collector suspending the reflector at the underside of the collector for support thereby, and

spacing means disposed between the tubular collector and



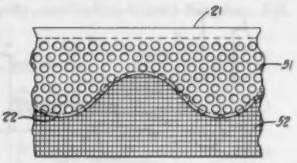
the reflecting surface engaging the collector at plural longitudinally spaced points on its outer surface for maintaining the collector at a predetermined spacing from the concave plane of the reflecting surface.

4,091,797

SOLAR AIR HEATER ARRAY

Kurudamannil A. George, Levittown, Pa., assignor to SCM Corporation, New York, N.Y.

Filed Nov. 10, 1976, Ser. No. 740,600
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **6 Claims**



1. A solar air heater comprising in array a plurality of structurally rigid, air-canalizing modular ducts,

said ducts communicating in parallel flow with a common air header,

said header being directed towards fan suction,

each said duct having:

a. length of about 4–6 meters,

b. width of about 1.2 meters,

c. a substantially flat bottom,

d. low sidewalls transverse to said bottom,

e. an open top,

f. a transparent cover over said top,

g. a solar heat collector element interposed between said bottom and said top for substantially the length of said duct, thereby forming upper and lower air plena for said duct,

h. about 100–650 $cm.^2$ cross sectional area of lower plenum air passageway, and

i. flow impeding means having a flow restrictive member disposed within the upper plenum for impeding air flow velocity in the upper plenum to about 2–20% of that in said lower plenum, at least the bottom and exposed walls of said array being insulated for heat retention.

4,091,798

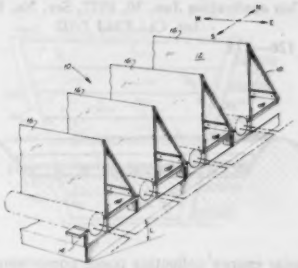
NON-TRACKING SOLAR ENERGY COLLECTOR SYSTEM

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and M. Kudret Selcuk, LaCanada, Calif.

Filed Feb. 3, 1977, Ser. No. 765,139
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **1 Claim**

1. In a non-tracking solar energy collector system characterized by a vacuum-jacketed receiver including a plurality of uniformly spaced segments arranged in coplanar parallelism for conducting fluid along a serpentine path, the improvement comprising:

an energy concentrator for directing incident rays of solar energy on the segments of the conduit including a plurality of individually mounted, elongated, uniformly dimensioned reflector modules of a common asymmetrical triangular cross-sectional configuration dispersed in a uniform array and characterized by adjacent reflector surfaces disposed in inclined planes sequentially intersecting above and beneath the plane of the segments of the conduit, each reflector module of the plurality being oriented in east-west alignment and characterized by a pair of reflector surfaces oppositely inclined in north-south directions at mutually distinct angles of inclination relative to the planes of the segments of the conduit for thus defining between adjacent pairs of modules apertures uniformly tilted in north-south directions; and



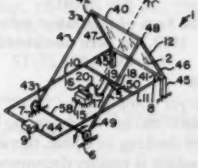
means for varying the tilt of the apertures including means for facilitating a reversal of the angle of inclination at which said reflector surfaces are tilted in north-south directions.

4,091,799

SELF-TRACKING RADIANT ENERGY COLLECTOR

Robert E. Steiner, Creve Coeur, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Mar. 10, 1977, Ser. No. 776,306
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **21 Claims**



1. A solar energy device, comprising:

an energy conversion means positioned at an energy reception area;

a movably mounted energy concentrator adapted to concentrate energy on said reception area; and

heat sensitive expansion means operatively connected between said reception area and said movably mounted energy concentrator, said energy concentrator having an aligned position and a disaligned position with respect to said energy reception area, said expansion means expanding and contracting to control movement of said concentrating means, said concentrating means directing energy toward said reception area in said aligned position, and

directing energy toward said expansion means in said disaligned position.

4,091,800

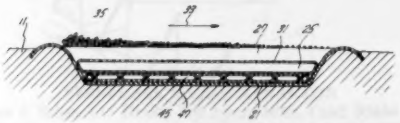
SOLAR POND

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Charles G. Miller, Pasadena, and James B. Stephens, La Crescenta, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 590,975, Jun. 27, 1975, abandoned. This application Jun. 30, 1977, Ser. No. 811,815

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—271 **18 Claims**



1. A solar energy collecting pond, comprising:

a trench formed in the Earth's surface;

a heat-absorbing, liquid-impervious material lining said trench;

a first heat-absorbing liquid contained by the lined trench, said liquid being stagnant;

a second heat-absorbing liquid contained in a tube of transparent plastic material within said first liquid, said tube of heat-absorbing liquid conforming to the bottom of said trench adjacent to said heat-absorbing lining material, said second liquid flowing through its tube; and

a covering means floating on and suspended by said first liquid permitting light rays to pass therethrough into said first liquid for maintaining said first liqid relatively free of dirt and debris and reducing heat loss therefrom.

4,091,801

DEEP FAT FRYER

Lazaros J. Lazaridis, Lincoln; Edward F. Searight, Harvard, both of Mass., and Paul K. Shefsiek, Farmington, Mich., assignors to Thermo Electron Corporation, Waltham, Mass.

Continuation of Ser. No. 541,482, Jan. 16, 1975, Pat. No. 3,985,120, which is a continuation-in-part of Ser. No. 359,974, May 14, 1973, abandoned. This application Sep. 23, 1976, Ser. No. 725,813

The portion of the term of this patent subsequent to Oct. 12, 1993, has been disclaimed.

Int. Cl.[2] A47J *27/17*

U.S. Cl. 126—378 **2 Claims**

1. A deep fat fryer comprising:

a relatively deep cooking vat adapted to contain and to heat for immersion cooking an edible, thermally decomposable cooking oil which is rapidly decomposed at temperatures substantially above normal cooking temperatures, the internal portions of said vat being free from obstuctions and open at its top;

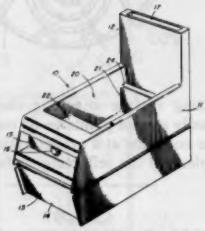
a heat transfer liquid volatile at normal cooking temperatures sealed within a jacket at least partially surrounding said vat, the interior of said jacket being essentially devoid of substances which are not condensible at operating conditions;

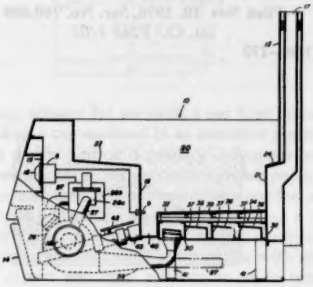
heating means;

means defining a heating zone for the heat transfer liquid said means including a first heat transfer wall and a second heat transfer wall, each of said heat transfer walls forming a portion of said jacket,

said first heat transfer wall being adjacent said heating means to conduct heat from said heating means to said heat transfer liquid to vaporize said liquid,

said second heat transfer wall being a wall of said cooking vat adapted to be in direct liquid-to-wall contact with said cooking oil to transfer heat rapidly from said wall to said cooking oil, said second heat transfer wall including an oil heating portion along the bottom wall of said vat across less than all of said bottom wall;





said jacket defining a sealed free path between said first heat transfer wall and said second heat transfer wall to permit heat transfer liquid to pass from said first heat transfer wall to said vat, and to permit condensed heat transfer liquid to return to said first heat transfer wall;

a recess at the bottom of said vat adjacent said oil heating portion,

whereby heating said oil causes convection currents to carry contaminants in said oil to said recess.

4,091,802

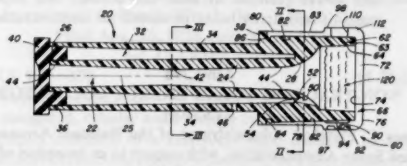
VENTED LIQUID COLLECTION DEVICE

Richard L. Columbus, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 17, 1976, Ser. No. 658,208

Int. Cl.[2] A61B *5/14*

U.S. Cl. 128—2 F **18 Claims**



1. In a device for collecting and separating blood serum and including

a collection and separation compartment defined by opposed side walls extending between two opposed ends, one of

said ends being closed by blood inlet means capable of penetration by a cannula, said side walls being spaced apart adjacent to each of said ends by a distance sufficient to allow noncapillary flow of blood along said side walls, and

a thixotropic gel phase separator adjacent the other of said ends, said separator being movable in said compartment and adapted for sealing across said compartment the zone of phase separation between serum and blood cells when the blood is centrifuged in said compartment;

the improvement wherein said compartment side walls converge at a portion between said ends to form a neck which is reduced in a dimension transverse to fluid flow therethrough in an amount sufficient to induce capillary flow of blood through the neck,

and said device further includes means defining an overflow storage compartment located adjacent to said collection and separation compartment, said compartments being fluidly connected at said other end by an overflow passageway, said passageway including means cooperable with said phase separator for terminating flow therethrough at the time the serum is separated from blood cells by the phase separator.

4,091,803

TRANSDUCERS

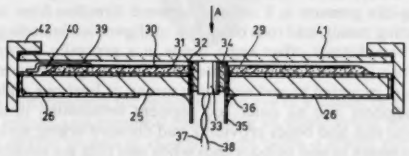
Russell Stuart Pinder, Newcastle-upon-Tyne, England, assignor to Thomas Orr, Southampton, England

Filed Feb. 9, 1976, Ser. No. 656,842

Claims priority, application United Kingdom, Feb. 17, 1975, 6668/75

Int. Cl.[2] A61B *5/02*

U.S. Cl. 128—2.05 P **3 Claims**



1. A transducer for detecting heartbeats and supplying an output signal in dependence thereon with a frequency component of the output signal corresponding to a heartbeat rate to be detected, said transducer comprising a light emitting diode and a planar opto-electronic detector which is a photo-conductive cell encircling said light emitting diode and which comprises an electrically insulating substrate, an insulating film on said substrate, a photo-voltaic PN junction on the surface of said insulating film comprising a layer of cadmium sulfide and an annular disc of cuprous sulfide on the surface of said layer of cadmium sulfide to provide a light sensitive surface layer, first and second output terminals, conductor means connecting each of said output terminals to a respective one of said layers, the transducer adapted to be mounted on a watch case component means positionable adjacent the skin of a user with the light emitting diode facing the skin of the user to emit light thereagainst being energizable by a periodic signal from a source contained in said watch case component means, the light emitting diode being positioned when in use to emit light toward a surface of skin tissue of a user to transilluminate said surface of skin tissue to cause the surface of skin tissue to emit light and the opto-electronic detector encircling said light emitting diode so as to be positioned in close proximity to said surface of skin tissue so that the majority of light originating from said light emitting diode emitted from said surface of skin tissue is directed into said opto-electronic detector which detects variations in the reflected light level from said surface of skin tissue and provides said output signal to said first and second output terminals in response to changes in arterial blood flow.

4,091,804

COMPRESSION SLEEVE

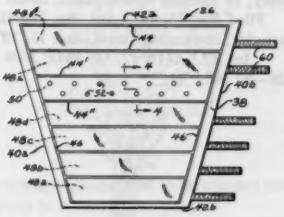
James H. Hasty, Cary, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Dec. 10, 1976, Ser. No. 749,494

The portion of the term of this patent subsequent to Jun. 21, 1994, has been disclaimed.

Int. Cl.[2] A61H *1/00*

U.S. Cl. 128—24 R **6 Claims**



1. A device for applying compressive pressures against a patient's limb from a source of pressurized fluid, comprising:

an elongated pressure sleeve for enclosing a length of the patient's limb, said sleeve having a plurality of separate fluid pressure chambers progressively arranged longitudinally along the sleeve from a lower portion of the limb to an upper portion of the limb proximal the patient's heart relative said lower portion, said sleeve including flexible sizer means extending between a pair of adjoining chambers and having a sufficient length to permit adjustment of the sleeve on limbs of varying sizes between a first position with said adjoining chambers being spaced apart a relatively small distance and a second position with said adjoining chambers being spaced from each other a relatively large distance, said sizer means being uninflated during use of the device; and

means for intermittently inflating and deflating said compression chambers.

4,091,805

VIBRATING BACK SCRATCHER

Madalin M. Clark, Wytheville, Va., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Mar. 18, 1977, Ser. No. 778,835

Int. Cl.[2] A61H *1/00*

U.S. Cl. 128—41 **2 Claims**

1. A vibrating back scratcher, comprising

an elongated rod having spaced opposite first and second ends;

an artificial hand having a plurality of fingers bent in scratching position and a wrist, said hand being affixed at the wrist thereof to the first end of the rod;

a hollow handle having an open end and coaxially accommodating the second end of the rod via the open end thereof;

an electric vibrating device in the handle in operative proximity with the second end of the rod for vibrating the rod in axial direction;

rechargeable battery means in the handle for energizing the vibrating device;

ON-OFF switch means in the handle and extending therefrom for manual operation thereof; and

electrical conductors in the handle electrically connecting the vibrating device, the battery means and the switch means in circuit whereby the vibrating device is energized by the battery means under the control of the switch means to vibrate the rod and the hand in axial directions.

4,091,806

INTRAMEDULLARY COMPRESSION NAIL FOR THE TREATMENT OF BONE FRACTURES

Jacob Aginsky, 18 Rachael Street, Haifa, Israel

Filed Jan. 13, 1977, Ser. No. 759,013
Claims priority, application Israel, Jan. 13, 1976, 48826
Int. Cl.[2] A61B *17/18;* A61F *5/04*
U.S. Cl. 128—92 BC **4 Claims**

1. A nail adapted to connect and to compress fractured bone parts, more especially a fractured femur, by its insertion into the medullary cavity of the bone with its front end first and with its rear end protruding out of the drilled bone end, the nail being provided with an expansible portion at its front end to be biased against the bone walls of the flared-out cavity at one end of the bone and with a rear portion provided with means for biasing the protruding end against the outside of the bone at its other end, the nail comprising:

a cylindrical hollow sheath having its front end longitudinally slotted to form at least two spreadable branches and having its rear portion provided with outer screw thread interrupted by at least two flat longitudinal faces adapted to be gripped by a spanner or similar tool, the sheath being further provided with a central cylindrical bore enlarged at its rear end to form a cylindrical recess;

an expansion member adapted to be pulled rearward into the longitudinal slot of the sheath so as to spread said branches, and provided with at least two lateral longitudinal ribs adapted to be moved into the slots between the branches, the expansion member being further provided with a screw-threaded bore extending through its entire length;

a cylindrical bar of a diameter permitting its rotary motion in the bore of the sheath, having its rear end enlarged corresponding to the size of said cylindrical recess in the sheath and having its rear face provided with a recess for engagement with a tool, such as a spanner, for rotating the bar in the sheath, the front portion of the bar being provided with outer screw-thread corresponding to the screw-thread in the expansion member, the latter member being rotatably positioned on the end of the bar;

biasing means in the shape of a compression disc having at least one forwardly protruding prong on its circumference and having a central perforation corresponding in shape to the cross section of the protruding rear portion of the sheath, positioned on said rear portion so as to be movable in axial direction only;

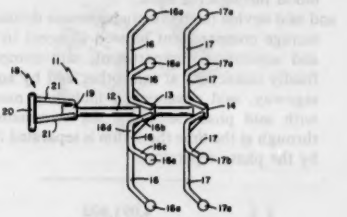
a screw nut positioned on the screw-threaded portion of the sheath to the rear of said compression disc.

4,091,807

INTRA-VAGINAL DEVICE AND METHOD OF USE

Ben Wade Oakes Dickinson, III, 2125 Broderick St., San Francisco, Calif. 94115, and Robert Wayne Dickinson, 40 Maplewood Dr., San Rafael, Calif. 94901

Filed Nov. 4, 1976, Ser. No. 738,886
Int. Cl.[2] A61F *5/46*
U.S. Cl. 128—130 **12 Claims**



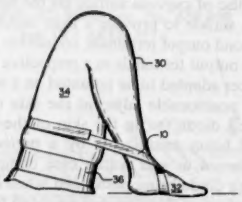
1. An intra-vaginal device comprising mounting means, and a plurality of elongate resilient rods mounted at their fixed ends to radiate outwardly from said mounting means and terminating in free ends of enlarged bulbous configuration, said rods being characterized by a combination of internal memory and a configuration of changing axial direction such that when said rods are subjected to a bending moment to move said bulbous ends toward each other, said bulbous ends are urged under spring-like pressure in a radially outward direction from said mounting means, said rods being in a configuration including at least two distinct offset angle bends in a generally outward direction from said mounting means and defining an inner rod segment mounted to said mounting means, at least one middle rod segment and an outer rod segment terminating in said bulbous end, said bends providing said outward urging spring-like pressure to said bulbous ends when said rods are subjected to a bending moment toward said mounting means.

4,091,808

STRAP FOR IMMOBILIZING HUMAN LIMB DURING SURGERY

Mary E. Nelson, 10325 NE. Hancock Apt. #17, Portland, Oreg. 97220

Filed Mar. 21, 1977, Ser. No. 779,321
Int. Cl.[2] A61F *13/00*
U.S. Cl. 128—133 **2 Claims**



1. A strap for restraining a human leg in a flexed position during surgery upon the knee portion thereof so as to prevent the leg from extending and yet to permitting its rapid release for the purpose of extending and flexing the limb as and when required, said strap comprising:

(a) an elongate strip of flexible material having a top and bottom surface and being adapted for forming into a first

closeable loop around the foot portion of the leg and a second closeable loop around the thigh of the leg so as to releasably maintain said foot and thigh in a close associative relationship during surgery upon the knee portion thereof;

(b) first closure means disposed on said top and bottom surfaces of said strip, adjacent the midportion thereof, for releasably closing said first loop when positioned around said foot, said first closure means providing said first loop with a periphery of continuously adjustable length; and

(c) second closure means disposed on said top and bottom surfaces of said strip, adjacent the ends thereof, for releasably closing said second loop when positioned around said thigh, said second closure means providing said second loop with a periphery of continuously adjustable length.

4,091,809

PARTIALLY TRANSPARENT EYESHIELD

William C. Cortner, Jr., and Rogers C. Daniels, both of St. Joseph, Mo., assignors to Philips Roxane, Inc., St. Joseph, Mo.

Filed Oct. 18, 1976, Ser. No. 733,477
Int. Cl.[2] A61F *13/12*
U.S. Cl. 128—163 **10 Claims**

1. An eyeshield for protecting the eye of a human or domestic animal, said eyeshield comprising an upper eyelid protecting section formed of closely woven cloth, a lower, eye protecting section, pervious to light and moisture but impervious to insects and other solid eye irritants formed of a cloth web and means for attaching said upper section to said lower section along a line of attachment in a manner such that a protrusion extends outwardly from the eyeshield along said line of attachment and the eyeshield assumes a convex configuration, from a normally essentially flat configuration, when in an eye shielding position.

4,091,810

METHOD FOR INTRAVENOUS FEEDING OF A PATIENT

Ingemar H. Lundquist, Oakland, Calif., assignor to Valleylab, Boulder, Colo.

Division of Ser. No. 627,842, Nov. 3, 1975, abandoned. This application Sep. 27, 1976, Ser. No. 727,294
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—214 F **2 Claims**

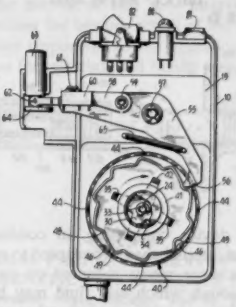
1. The method of providing for a "fail-safe" intravenous feeding of a patient which comprises:

(a) providing at the bedside of the patient an intravenous feeding pump and a pump actuator having a readily insertable and removable cam which controls the number of pump strokes per unit of time and also the amount injected by each stroke;

(b) preparing at a place remote from the patient and in a suitable container the proper amount of material to be injected into the veins of the patient and providing at such place a cam adapted to provide the prescribed feeding rate to the patient;

(c) transporting the said material to be injected and the said cam to the bedside of the patient;

(d) connecting the said container of material to be injected to said pump and placing the said cam in said actuator; and



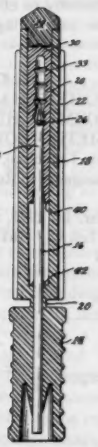
(e) filling the pump with material to be injected and connecting said pump to a vein of the patient.

4,091,811

NEEDLE COVER

David A. Bates, Libertyville, and Angelo T. Capritta, Schaumburg, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Nov. 15, 1976, Ser. No. 741,875
Int. Cl.[2] A61M *5/14*
U.S. Cl. 128—214.4 **4 Claims**



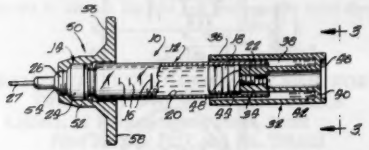
1. In a needle cover which comprises a first sleeve positioned about a pointed hypodermic needle, said first sleeve being removably carried by a hub which also carries said needle, the improvement comprising, in combination:

an inner sleeve positioned within said first sleeve and about the point of said needle, said inner sleeve being free of mechanical attachment to said first sleeve, and means connecting said first sleeve to said hub, whereby, upon rotation of said first sleeve for removal thereof, said inner sleeve does not rotate with said first sleeve.

4,091,812
OPERATOR MEANS FOR SYRINGE CARTRIDGES

Michael L. Helixon, and Barry S. Ward, both of Fort Worth, Tex., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Filed Jan. 19, 1976, Ser. No. 650,248
Int. Cl.[2] A61M 5/00
U.S. Cl. 128—218 D 5 Claims

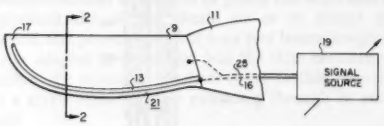


1. A syringe device comprising, in combination, barrel means defining an internal chamber adapted to contain a quantity of fluid, discharge means mounted on one end of said barrel means through which said fluid may be discharged, plunger means disposed within said chamber and movable to effect discharge of said fluid, and operator means cooperable with said plunger means and operable to move said plunger means to effect said discharge of fluid, said operator means including a sleeve portion adapted to receive said barrel means therein and progressively telescope said barrel means as said operator means is moved longitudinally relative to said barrel means to effect fluid discharge from said discharge means, said operator means including first stop means adapted for engagement with said barrel means to limit movement of said operator means in a discharge direction relative to said barrel means whereby to establish a first predetermined dosage discharge from said syringe, said operator means being reversible end-for-end and longitudinally movable relative to said barrel means in a reversed position to move said plunger means in a discharge direction, said operator means including second stop means operable to engage said barrel means and limit longitudinal movement of said operator means in a discharge direction relative to said barrel means when said operator means is in its reversed position, whereby to effect a second predetermined dosage discharge from said syringe.

4,091,813
SURGICAL INSTRUMENT HAVING SELF-REGULATED ELECTRICAL PROXIMITY HEATING OF ITS CUTTING EDGE AND METHOD OF USING THE SAME

Robert F. Shaw, San Francisco, Calif., and David E. Stutz, Columbus, Ohio, assignors to Robert F. Shaw, Portola Valley, Calif.

Filed Mar. 14, 1975, Ser. No. 558,334
Int. Cl.[2] A61B 17/38
U.S. Cl. 128—303.14 65 Claims



1. A blade comprising:

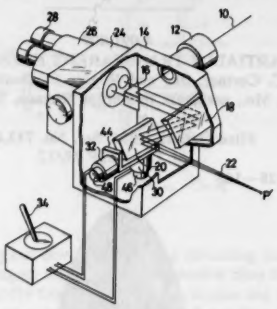
a cutting means including a cutting edge having an electrically conductive material disposed in the region of said cutting edge; and

an electrical conductor means disposed adjacent the cutting edge and between distal and proximal ends of said cutting means, said electrical conductor means being disposed in electromagnetically coupled and electrically insulated relationship to said electrically conductive material and being conductively connected to the material only near the distal end of the cutting means (edge) for providing a conductive path through the material along said cutting means (edge) between the conductive connection to said electrical conductor means and the proximal end of said cutting means (edge).

4,091,814
LASER OPTICAL APPARATUS FOR OPERATION UNDER A MICROSCOPE

Takashi Togo, Tokyo, Japan, assignor to Mochida Pharmaceutical Co., Ltd., Kamiya, Japan

Filed Mar. 14, 1977, Ser. No. 777,417
Claims priority, application Japan, Mar. 15, 1976, 51-27041
Int. Cl.[2] A61B 17/36
U.S. Cl. 128—303.1 4 Claims

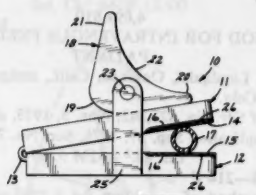


1. A laser optical apparatus for operation under a microscope comprising: a laser beam introducing 45° reflector arranged between two optical axes so as not to impair the range of vision frontwardly of a binocular telescope for operation, a parabolic mirror with a surface displaced from an axis for condensing introduced beams of laser and serving as an objective lens of the microscope, a plane reflector for directing the condensed beams of laser and an optical axis of the microscope, and a servo mechanism for controlling the position of said plane reflector.

4,091,815
FLEXIBLE TUBE CLAMP

Otis M. Larsen, 4036 Reservoir Blvd., Minneapolis, Minn. 55421

Filed Jul. 6, 1976, Ser. No. 702,488
Int. Cl.[2] A61B 17/12
U.S. Cl. 128—325 12 Claims



7. A surgical clamp comprising:

first and second clamping members having clamping surfaces which are curved longitudinally to facilitate insertion of the clamp into relatively inaccessible body areas;

hinge means for connecting said clamping members at one end thereof;

a pair of posts secured to said first clamping member;

rotatable cam means eccentrically mounted on a shaft pivotally retained by said posts and having a curved cam sur-

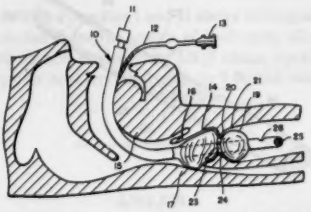
face portion rotatable into contact with said second clamping member for urging said clamping members together to a closed position, said curved cam surface portion being trailed by a flat cam surface portion rotatable into contact with said second clamping member for preventing free rotation of said cam means.

4,091,816

DOUBLE CUFFED ENDOTRACHEAL TUBE

James O. Elam, 6723 S. Euclid, Chicago, Ill. 60649

Filed Jan. 28, 1977, Ser. No. 763,354
Int. Cl.² A61M *25/00*
U.S. Cl. 128—351 **8 Claims**



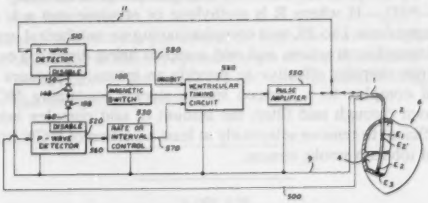
1. An endotracheal airway device adapted for insertion through the mouth and into the trachea of a patient to provide a passage for artificial respiration comprising an elongated flexible air tube having proximal and distal end portions, an inflatable-deflatable pair of cuff means secured to and encircling said tube intermediate said proximal and distal end portions to define an upper cuff means and a lower cuff means, said upper and lower cuff means being adapted to accommodate the larynx and being in communication with one another, said upper cuff means having elastic properties, said lower cuff means being shaped to fit into the space defined by the upper trachea and subglottic regions, said lower cuff means having pliable inelastic properties, and means for inflating and deflating said upper and lower cuff means.

4,091,817

P-WAVE CONTROL, R-WAVE INHIBITED VENTRICULAR STIMULATION DEVICE

Sherwood Sheldon Thaler, Calabasas, Calif., assignor to American Optical Corporation, Southbridge, Mass.

Filed Sep. 27, 1976, Ser. No. 726,887
Int. Cl.² A61N *1/36*
U.S. Cl. 128—419 PG **14 Claims**



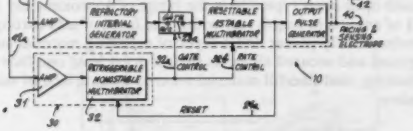
1. A heart stimulating device for stimulating the heart of a patient, said device comprising terminal means for connection to said patient's heart, timing means for at least establishing timing intervals at least as long as a basic interval, pulse generator means for generating a ventricular stimulation impulse on said terminal means at end of each of said timing intervals, first means for detecting the beating action of the atrium of said heart, means responsive to the operation of said first detecting means for generating an A-V interval pulse, said timing means including control means responsive to said A-V interval pulse for at least lengthening said timing interval beyond said basic interval if the otherwise next generated one of said ventricular stimulation impulses would have occurred during the time of occurrence of said A-V interval pulse and for limiting said lengthened interval to be no longer than the sum of said basic interval and the interval of said A-V interval pulse, second means for detecting the beating action of the ventricle of said heart, and means responsive to the operation of said second detecting means for resetting said timing means.

4,091,818

CARDIAC PACING APPARATUS WITH ELECTROMAGNETIC INTERFERENCE PROTECTION

Robert R. Brownlee, State College, and G. Frank O. Tyers, Hershey, both of Pa., assignors to Research Corporation, New York, N.Y.

Filed Aug. 3, 1976, Ser. No. 711,254
Int. Cl.² A61N *1/36*
U.S. Cl. 128—419 PG **9 Claims**



1. An improved cardiac pacing apparatus of the type having first electrode means for sensing and pacing connectable to the heart; a first signal processing channel including means for generating artificial heart stimulating pulses at a predetermined rate and applying said pulses to said first electrode means, first bandpass amplifier means having an input connected to said first electrode means for detecting natural heart stimulating pulses, said artificial heart stimulating pulses and electromagnetic interference, and producing a detection signal having a rate in accordance therewith, and first control means, responsive to said detection signal and having an output operatively coupled to said means for generating artificial heart stimulating pulses, for continuously inhibiting the generation of said artificial pulses whenever the rate of said detection signal exceeds said predetermined rate; wherein the improvement comprises a second signal processing channel including:

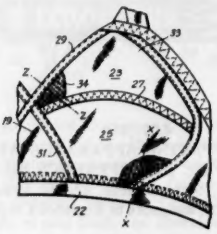
second bandpass amplifier means for detecting electromagnetic interference and producing a blocking signal in accordance therewith, said second bandpass amplifier means having an enhanced high frequency response with respect to the high frequency response of said first bandpass amplifier means to enhance the relative sensitivity of said second bandpass amplifier means to the higher frequency spectral components of said electromagnetic interference; and

second control means, responsive to said blocking signal and having an output operatively coupled to said first control means, for preventing said first control means from inhibiting the generation of said artificial heart stimulating pulses whenever said blocking signal is produced, thereby causing the generation of artificial heart stimulating pulses at said predetermined rate whenever electromagnetic interference is detected by said second bandpass amplifier means.

4,091,819
PADDED BRASSIERES

William Huber, Renfrew, Scotland; Nathan D. Field, Wyckoff, N.J.; Herman L. Marder, Plainfield, N.J., and Raymond C. Cole, Hillsdale, N.J., assignors to International Playtex, Inc., New York, N.Y.

Continuation of Ser. No. 585,928, Jun. 11, 1975, abandoned.
This application Mar. 28, 1977, Ser. No. 781,613
Int. Cl.[2] A41C 3/10
U.S. Cl. 128—479 10 Claims

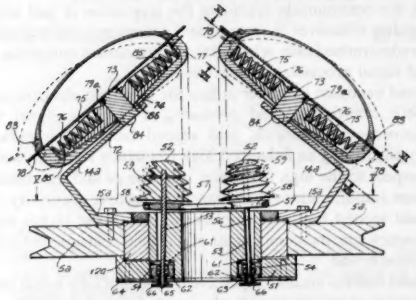


1. A brassiere construction including cups having a fiberfill padding wherein said fiberfill padding includes a non-woven batting of synthetic fibers formed together into a cohesive web, said batting having a plurality of open areas extending completely through the thickness of said batting and interstitial areas including said fibers between said open areas, said batting having at least a portion of the fibers interengaged for strength, said open areas typically in the range of approximately 1/32 to ¼ of an inch in length and width, the faces of said batting being substantially planar and a layer of covering material superimposed and secured along its surface to at least one face of said batting, said fiberfill material secured to a surface of said brassiere.

4,091,820
APPARATUS FOR REMOVING BRUSSELS SPROUTS FROM THE PARENT STALKS

Raymond William Mathews, Rathrobin, Blueball, Tullamore, County Offaly, Ireland

Filed Mar. 25, 1976, Ser. No. 670,268
Claims priority, application United Kingdom, Mar. 27, 1975, 12986/75
Int. Cl.[2] A23N 15/01; A65H 17/38
U.S. Cl. 130—30 R 10 Claims

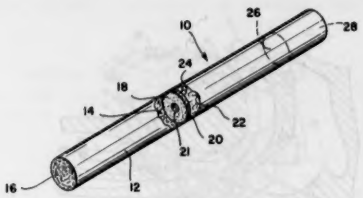


1. Apparatus for removing Brussels sprouts from a stalk, said apparatus comprising a rotatable blade assembly defining an aperture for receiving a stalk bearing Brussels sprouts, said assembly including at least three disc blades arranged generally in truncated pyramidal form to define said aperture, a blade support for each of said blades, each of said blade supports being independently and freely rotatable upon an axis which is displaceable relative to the axis of rotation of said assembly so that said aperture defined by said blades may change in response to pressure exerted on said blade supports by a stalk passing through said aperture.

4,091,821
SMOKING ARTICLE HAVING AN IGNITION SUPPRESSION DISK

Samuel P. Scorzo, 2881 Dahlia Ave., Baldwin, N.Y. 11510

Filed Nov. 2, 1976, Ser. No. 738,054
Int. Cl.[2] A24D 1/10
U.S. Cl. 131—4 A 5 Claims



1. A smoking article comprising a tubular combustible smoking wrapper, a long fill of tobacco in said wrapper extending inwardly from one end of said wrapper from about one-half to about two-thirds the length of said wrapper and terminating at an inner face within said wrapper, a smoke permeable ignition supression disk within said smoking wrapper abutting said inner face of said long fill of tobacco, said disk comprising a low density polyolefin thermoplastic disk having opening means therein, said opening means being of a sufficient size to allow the passage of smoke therethrough when said smoking article is ignited and to fuse shut when the ignited portion of said smoking article is substantially adjacent said ignition suppression disk.

4,091,822
ARTICLE FOR THE SELECTIVE REMOVAL OF HYDROGEN CYANIDE FROM TOBACCO SMOKE

Arthur Morton Ihrig, and David Lynn Williams, both of Greensboro, N.C., assignors to Loews Theatres, Inc., New York, N.Y.

Filed Apr. 25, 1975, Ser. No. 571,758
Int. Cl.[2] A24B 15/027; B01D 39/00
U.S. Cl. 131—9 30 Claims

1. An improved tobacco smoke filter comprising a complex formed by combining a water-soluble salt of a metal selected from the group consisting of zinc, copper, nickel and iron (II) with a polydentate amine of the general formula NH_2—(-R—$NH)_x$—H where R is methylene or ethylene and x is an integer from 1 to 10, said complex having an octahedral crystallographic structure, and said complex being dispersed on a carrier therefor effective to provide an intimate exposure of said complex to a tobacco smoke stream containing HCN drawn through said filter, the amount of said complex being sufficient to remove selectively at least a portion of HCN from said tobacco smoke stream.

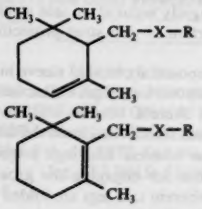
4,091,823
CYCLOGERANIOL AND DERIVATIVES THEREOF AS TOBACCO FLAVORANTS

Andrew George Kallianos; Everett West Southwick, both of Durham, N.C., and Melvyn Irving Simpson, Fargo, N. Dak., assignors to Liggett Group Inc., Durham, N.C.

Filed Jul. 12, 1976, Ser. No. 704,721
Int. Cl.[2] A24B 3/12
U.S. Cl. 131—17 R 24 Claims

1. A method for improving the flavor of tobacco which comprises adding thereto an amount sufficient to alter the

flavor of the tobacco of at least one compound of the following formulas:



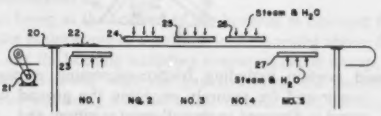
wherein X in both Formulas I and II above is oxygen or sulfur and R is selected from the group of hydrogen; alkyl having from 1 to 10 carbon atoms in the alkyl chain; cycloaliphatic; aryl; araalkyl; or acyl having from 1 to 9 carbon atoms in the acyl chain.

4,091,824

METHOD AND APPARATUS FOR CONDITIONING MATERIAL UTILIZING AIRFLOW CONTROL MEANS

John D. Psaras, Louisville, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Jul. 15, 1976, Ser. No. 705,739
Int. Cl.² A24B *3/00*
U.S. Cl. 131—135 **11 Claims**



11. In an apparatus for use in conditioning tobacco including a conveyor device to transport the tobacco on its surface along a path for conditioning the tobacco at selected times and location, the improvement comprising:

a source of gas to produce a gas stream,

means operatively associated with the source of gas to selectively condition the gas stream,

flow straightening means having a plurality of parallel, similarly shaped conduits having a hydraulic diameter to length ratio in the range of 1:5 to 1:30 postioned in spaced relation to and upstream of the conveyor surface supporting said tobacco,

means to direct the gas stream through the flow straightening means to thereby spread the gas stream in laminar flow evenly across the conveyor for uniform conditioning of the transported tobacco.

4,091,825

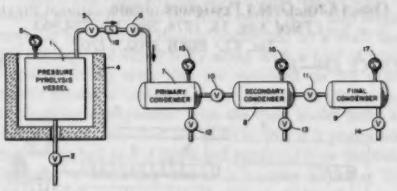
RECOVERY OF UNOXIDIZED METALS FROM ORGANIC INSULATED METALLIC SCRAP

Albert B. Baker, Cottage Hills, Ill., assignor to International Recycling Enterprises, Ltd., Godfrey, Ill.

Filed May 27, 1976, Ser. No. 690,503
Int. Cl.² B01D *5/00*
U.S. Cl. 134—2 **25 Claims**

1. A method for removing organic insulation from insulated metallic scrap comprising:

(a) thermally decomposing said organic insulation into volatile and non-volatile decomposition products in a closed, externally heated vessel at a pressure of at least 10 psi above atmospheric pressure, and



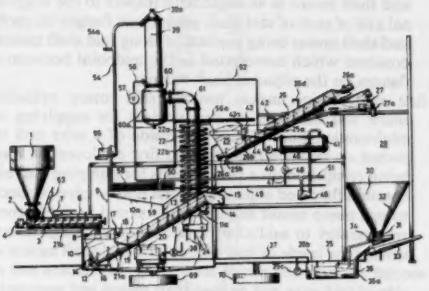
(b) separating said metallic scrap from said non-volatile decomposition products.

4,091,826

METHOD FOR DEGREASING ROLLING MILL SCALE

Ludwig Bahrke, Unna-Massen, Germany, assignor to Hoesch Werke Aktiengesellschaft, Dortmund, Germany

Filed Jul. 20, 1976, Ser. No. 706,946
Claims priority, application Germany, Jul. 22, 1975, 2532689
Int. Cl.² B08B *3/08*
U.S. Cl. 134—11 **14 Claims**



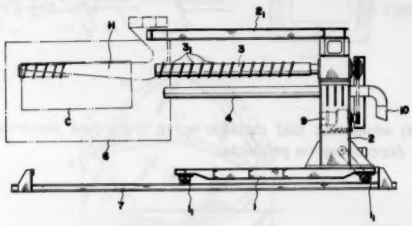
1. A method of treating grease-covered rolling mill scale from rolling mills, especially hot rolling mills, by means of solvents, which includes the steps of: weighing the rolling mill scale to be treated, thoroughly mixing the weighed rolling mill scale with an amount of oil-free grease solvent from 10 to 20% by weight of the scale to form a mixture while finely distributing the grease in the mixture, adding said mixture in a continuous manner to a bath containing grease solvent and distributing said mixture therein, slowly moving said rolling mill scale out of said solvent-containing bath subsequently mixing said rolling mill scale after it has been moved out of the bath with additional oil-free grease solvent passed in counter-current flow to said mill scale, continuing the movement of the mill-scale and draining off solvent containing grease from the rolling mill scale leaving substantially grease-free mill scale, regenerating the grease-containing solvent by distilling it and condensing oil-free solvent therefrom, recycling the condensed oil-free solvent to mix with additional grease-covered rolling mill scale to be degreased, moving the substantially grease-free mill scale on a helical reciprocatory plate feeder and contacting the mill scale with grease solvent vapors while it is being moved on said feeder, discharging the mill scale from said feeder into a bath of hot water at a temperature sufficient to heat the rolling mill scale and to drive residual solvent therefrom, and removing the mill scale from the hot water bath.

4,091,827

EDULCORATION EQUIPMENT FOR WIRE COILS

Kotaro Tsukamoto, 7-8, Kashima 4-Block, Yodogawa ward, Osaka City, Osaka Prefecture, Japan

Filed Aug. 16, 1976, Ser. No. 714,963
Int. Cl.[2] B08B *3/02, 11/02*
U.S. Cl. 134—149 **5 Claims**



1. An apparatus for edulcorating a wire coil with an edulcoration fluid said apparatus comprising:
a movable cart;
an upright projecting upward from said cart;
a plurality of horizontal rotating cylindrical shaft means for supporting and rotating said wire coil, said shaft means being horizontally parallel to and spaced from each other, mounted for rotation on said upright and projecting therefrom;
a plurality of parallel, angled flanges surrounding each of said shaft means at an angle with respect to the longitudinal axis of each of said shaft means, said flanges on each of said shaft means being positioned along said shaft means in positions which correspond to the midpoint between the flanges on the adjacent shaft means;
first edulcoration means beneath said rotary cylindrical shafts and mounted on said upright for supplying said edulcoration fluid against the inside of a wire coil supported on said shaft means, said first edulcoration means being comprised of: a pump means for pumping said edulcoration fluid and at least one, first hollow pipe connected to said pump means and mounted on said upright beneath and parallel to said shaft means with openings directed toward the inside of said wire coil on said shaft means; and
second edulcoration means above said shaft means and outside of said wire coil on said shaft means and mounted on said upright for supplying edulcoration fluid against the outside of said wire coil on said shaft means, said second edulcoration means being comprised of a plurality of second hollow pipes connected to said upright and projecting outward therefrom parallel to said shaft means and spaced therefrom, said hollow pipes having openings directed toward said shaft means, and said second hollow pipes being further connected to said pump means, whereby edulcoration fluid may be pumped therethrough at the same time said fluid is pumped through said first hollow pipe and said fluid in said second pipes will flow through said openings therein toward said shaft means and said wire coil thereon.

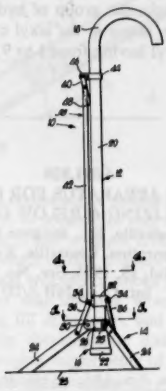
4,091,828

MANUALLY OPERABLE CRUTCH AND CANE STAND

Larry C. Jorgensen, Rte. 6, Lotus Club Rd., St. Joseph, Mo. 64504

Filed Mar. 9, 1977, Ser. No. 775,787
Int. Cl.[2] F16M *13/08*
U.S. Cl. 135—66 **1 Claim**

1. An improved walking aid including:
an elongate, normally upright strut having a lower and an upper end;
a support stand adapted to be mounted on said strut and including a cylindrical sleeve, a number of elongated legs pivotally mounted in spaced relation on the outer circumference of said sleeve, a cylindrical collar shiftable toward and away from said sleeve, and a number of pivot bars respectively intercoupling said legs with said collar,
said sleeve being rigidly secured on said strut adjacent said lower end, a portion of said strut projecting below said sleeve,
said collar being disposed above said sleeve in captive coaxial relation to said strut for reciprocal movement along the longitudinal axis thereof toward and away from said sleeve whereby said stand is rendered shiftable between an extended position wherein said legs project below said portion of the strut for engaging the ground and a collapsed position wherein said legs are folded alongside said strut above said portion,



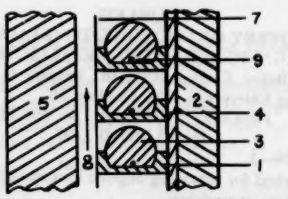
said portion including friction-increasing means at said lower end for securely engaging the ground when said stand is disposed in its collapsed position; and
a remote control attached to the strut adjacent said upper end for selectively collapsing or extending said stand,
said control having a manually manipulable lever, a mount pivotally securing said lever to said strut for up and down swinging movement about an axis laterally offset from said strut, and an elongated link extending between said stand and said lever in offset relation to said strut,
said lever, mount and link cooperating to form an overcenter action whereby to releasably retain said stand in either of said positions.

4,091,829

VERTICAL LIQUID ELECTRODE EMPLOYED IN ELECTROLYTIC CELLS

Donald J. Cotton, 1101 3rd St. SW., Washington, D.C. 20024

Continuation-in-part of Ser. No. 626,308, Oct. 28, 1975, Pat. No. 4,040,932. This application Feb. 3, 1977, Ser. No. 765,198
Int. Cl.[2] C25B *1/36*
U.S. Cl. 137—1 **2 Claims**



1. A method of creating, maintaining, and controlling a

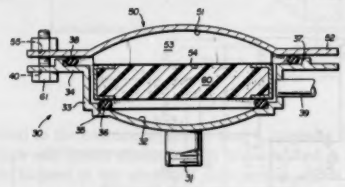
vertical component of a liquid surface which consists of confining said liquid in a horizontal capillary trough to which said liquid is non-adhesive, so that a meniscus with a vertical component of surface of said liquid projects above the edge of said capillary trough.

4,091,830

METHOD AND APPARATUS FOR REMOVING WATER FROM OIL STORAGE TANK

Gene Hirs, 6865 Meadow Lake Dr., Birmingham, Mich. 48010

Filed Feb. 18, 1977, Ser. No. 769,985
Int. Cl.² B01D *13/00*
U.S. Cl. 137—2 **10 Claims**



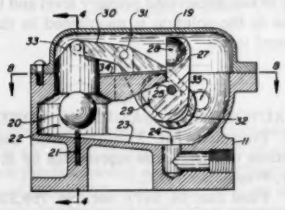
1. A valve, comprising a housing defining an interior cavity;
an inlet and outlet in the housing communicating with the cavity;
a water permeable body of polymer material in the cavity, the polymer being expandable when contacted with organic liquid to an extent sufficient to prevent fluid communication between the inlet and outlet;
the improvement of:
the inlet being at the bottom of the housing as oriented for use, the outlet being at a position in the housing above the inlet, and the housing including a removal cap at its top, as oriented for use, with the cap overlying the polymer material and being secured to the remainder of the housing by a plurality of bolts, such that upon removal of the cap the polymer may be vertically removed and replaced and then the cap may be re-secured to the housing by the bolts.

4,091,831

EMERGENCY SHUT-OFF VALVE

Ladislao Pazmany, San Diego, Calif.

Filed Jan. 5, 1977, Ser. No. 757,075
Int. Cl.² F16K *17/36*
U.S. Cl. 137—38 **4 Claims**



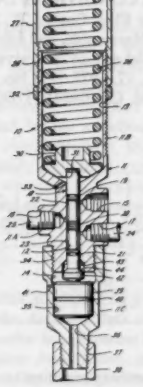
1. An emergency shut-off valve comprising:
a valve body having a fluid tight chamber, said valve body having a fluid inlet hole and a fluid outlet hole both of which are in communication with said fluid tight chamber,
means within said chamber for detecting a selected horizontal acceleration and for closing said fluid outlet hole when the horizontal acceleration is equal to or greater than the selected value due to an earthquake tremor, said means comprising a vertical support located within said valve body and a ball that is normally resting on the top of said vertical support,
means for resetting the ball back on top of the vertical support when it has fallen off the support and has traveled to a position where it plugs the fluid outlet hole, said means comprising an external handle connected to a shaft that passes through the valve body along with a pair of laterally spaced lifting arms that are mounted on the shaft, when the handle is turned the arms operate to lift the ball from plugging engagement with the fluid outlet hole, an incline is located adjacent the shaft so that it is positioned to receive the ball as it is lifted and removed from the fluid outlet hole, a centering sleeve is located adjacent the lower end of the incline so that when the ball is deposited at the top of said incline, it will roll downwardly to its lower end and drop into the centering sleeve that is supported above the vertical support.

4,091,832

VALVE

David E. Snyder; Joe B. Locke, and William C. Brabits, all of Longview, Tex., assignors to U.S. Industries, Inc., New York, N.Y.

Filed Mar. 29, 1976, Ser. No. 671,571
Int. Cl.² F16K *11/07, 31/122*
U.S. Cl. 137—72 **9 Claims**



1. A valve, comprising a body having a bore extending longitudinally therein and lateral ports therein connecting with the bore at longitudinally spaced locations, a spool longitudinally reciprocable within the bore between first and second positions, said spool having means including longitudinally spaced seal rings thereabout sealably slidable within the bore for controlling the flow of a first fluid between said ports in each of said positions, said body having an enlarged chamber at each end of the bore, a spring arranged in one of the chambers, means including a retainer releasably connectible to said body at the end of said one chamber for compressing said spring to apply a force to one end of the spool for urging said spool to its first position, a piston which is disconnected from the spool and sealably reciprocable in a cylinder of said other chamber, said body having a port therein for admitting a second fluid to the other chamber on the outer side of the piston to urge said piston against said spool and thereby urge said spool to its second position, said body having a conical seat about the intersection of said other chamber with the adjacent end of said bore, and said spool having a head with a conical shoulder thereon for engaging said seat so as to limit movement of said spool beyond said second position and form a metal-to-metal seal therewith.

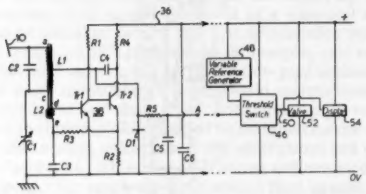
5. A valve, comprising a body including a first portion having a bore extending longitudinally therein and lateral ports therein connecting with the bore at longitudinally spaced locations, a spool longitudinally reciprocable within the bore between first and second positions, said spool having means including longitudinally spaced seal rings thereabout sealably slidable within the bore for controlling the flow of a first fluid between said ports in each of said positions, means urging said spool to its first position, said body also including a second tubular portion threadedly connected to the first body portion to form a chamber at one end of said bore, a piston having a seal ring thereabout sealably slidable within the chamber and being longitudinally reciprocable between first and second limited positions within said chamber, a port in said second body portion for admitting a second fluid to the chamber on the outer side of the piston seal to urge said piston to its second position, one end of the spool engaging the inner side of the piston to move it to its first position as the spool moves to its first position, and the inner side of the piston engaging said one end of the spool to move it to its second position as the piston moves to its second position, and a vent port in said second body portion which connects with said chamber on the inner side of said piston seal, when the threads between the housing and first body portion are fully made up, but which connects therewith on the outer side of said piston seal as the threads are partially disconnected and the piston is in both its first and its second position.

4,091,833

DEVICE FOR DETECTING PREDETERMINED FOAMING CONDITIONS IN FLUIDS

Christopher Ian Arthur Ellis, Copley 'B', Manor Road, Thornton Hough, Wirral, Merseyside, and Edward Leonard Naylor, 9 St. David Road, Birkenhead, Merseyside, both of England

Filed Jan. 17, 1977, Ser. No. 759,849
Int. Cl.[2] G05D *11/08*
U.S. Cl. 137—93 **8 Claims**



4. In an automatic washing machine having a washing chamber, a device responsive to a predetermined foaming condition of the washing fluid of the machine comprising:

a first inductive coil comprising a bifilar winding wound on a ferrite ring core with the two sections of the bifilar winding connected in series, the junction of said two sections forming the center tap of the coil;

capacitor means connected across the first coil to form a parallel circuit therewith;

first detector electrode means mounted adjacent the washing chamber of the machine and connected to one end of said first coil and adapted in use of the device to form one electrode of a capacitative element whose dielectric includes the machine washing fluid under test;

second detector electrode means adapted to form the other electrode of said capacitative element;

second capacitor means connected between the other end of said first coil and said second detector electrode means;

amplifier means having an input and an output, said amplifier output being coupled to said center tap of said first inductive coil;

a second, detector coil comprising a separate winding on said core located substantially at the mid-point between the ends of the bifilar winding and connected to the input of said amplifier, said second, detector coil being inductively coupled to said first coil whereby the mutual inductance between said first and second coils completes a feedback loop for said amplifier means; and

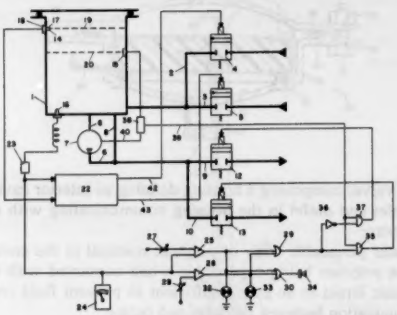
circuit means for producing an output signal dependent upon an oscillatory condition of said amplifier means.

4,091,834

APPARATUS FOR AUTOMATICALLY PREPARING SOLUTION OF CONTROLLED CONCENTRATION

Giovanni Frigato, Medolla, Italy, assignor to Sandoz Ltd., Basel, Switzerland

Filed Nov. 11, 1976, Ser. No. 740,789
Claims priority, application Italy, Nov. 14, 1975, 69808/75
Int. Cl.[2] G05D *9/12, 11/08, 11/13*
U.S. Cl. 137—93 **10 Claims**



1. An apparatus for automatically preparing a solution of controlled salt concentration, which comprises a mixer container in which preparation of the solution may take place, a regulator device for regulating supply of components of the solution to the mixer container, a level detector for detecting the level of solution in the mixer container in the vicinity of a prescribed primary level, a concentration probe for detecting concentration of salts in the solution, and a control device connected to receive electronic signals transmitted from said level detector and said concentration probe for producing a control output signal to control said regulator device, the control device comprising a first element for emitting a first level signal as a function of the signal from the level detector, and at least two secondary elements for associating said first level signal with a second reference level signal and for emitting a third control signal for controlling the regulator device, whereby the level of solution in the container is maintained in the vicinity of said prescribed primary level and the concentration of salts in the solution is maintained in the region of a predetermined value.

4,091,835

AUTOKINETIC SAMPLING NOZZLE

Charles H. Frampton, Mt. Pleasant, S.C., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

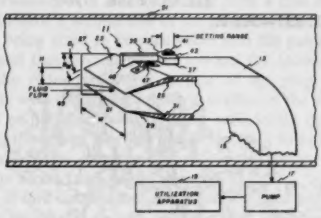
Filed Jan. 14, 1977, Ser. No. 759,526
Int. Cl.[2] G05D *7/01*
U.S. Cl. 137—118 **15 Claims**

1. An autokinetic fluid sampling device, comprising in combination:

duct means having an open fluid inlet at one end thereof and an open fluid outlet at the other end thereof;

means connected to said duct means for effectively varying the area of the open fluid inlet thereof in predetermined inverse proportion to the velocity of the flowing fluid being sampled in automatic response to the impact of said flowing fluid thereon; and

adjustable means effectively connected to said duct means adapted for timely engagement with said fluid inlet varying means in such manner as to limit the maximum area of the aforesaid open fluid inlet, said adjustable means including an elongated arm having a lower extending lip connected to the extremity thereof that is adjacent to said fluid inlet varying means, and a slotted extension connected to the extremity thereof that is opposite the one to which said lower extending lip is connected; a threaded hole located in the aforesaid duct means; and a threaded set screw extending through the slot of the slotted extension of said elongated arm and screwed to the aforesaid threaded hole, so as to firmly hold said elongated arm in a predetermined disposition with respect to said duct means and the aforesaid fluid inlet varying means.



4,091,836

SYSTEM COMPRISING AT LEAST ONE REACTOR

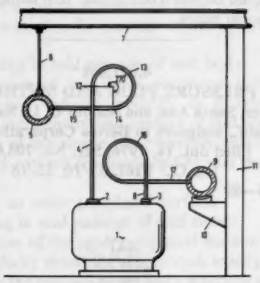
Cornelis Petrus Maria Clazing, Volendam, Netherlands, assignor to Ultra Centrifuge Nederland N.V., The Hague, Netherlands

Filed May 5, 1976, Ser. No. 683,613

Claims priority, application Netherlands, May 28, 1975, 7506266

Int. Cl.² E03B *11/00*

U.S. Cl. 137—259 **3 Claims**



1. A system comprising a plurality of reactors each of which is connected by a plurality of pipelines to each of a plurality of manifolds, each pipeline having a central pipelength curved in a circular arc of about 270° and connected at its ends to two substantially straight pipelengths which are arranged at a right angle with respect to each other, said reactors being arranged in multiple parallel rows, with said manifolds arranged parallel to the rows of reactors and on different levels over each other and vertically above the center line of said multiple parallel rows of reactors, in such a way that the distance between two successive manifolds is larger than the largest diametrical dimension of a curved central pipe-length and in such a way that with an even number of rows the manifolds are arranged in a vertical midplane lying between two innermost rows of reactors, the curved central pipelengths of the pipelines on both sides of the said plane facing away from each other.

4,091,837

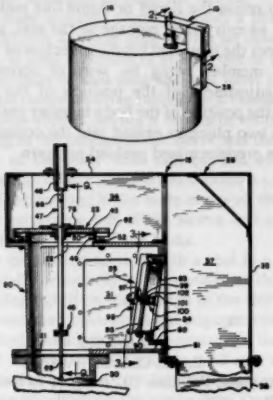
FREEZEPROOF BREATHER VALVE

Robert H. Edmunds, Glenview; John R. Huebner, Arlington Heights; James A. Skurka, Niles, and Francis B. Wilson, Wauconda, all of Ill., assignors to Vapor Corporation, Chicago, Ill.

Filed Aug. 2, 1976, Ser. No. 710,372

Int. Cl.² F16K *17/194*

U.S. Cl. 137—341 **20 Claims**



1. A vacuum responsive vent valve comprising a pallet seat adapted to be mounted in alignment with a vent opening communicating with the interior of a tank, said seat being positioned along a plane slightly tilted from the vertical, a pallet assembly movable between open and closed positions with respect to the seat and having a Teflon seal member engageable with the seat in closed position, hinge means for supporting said pallet assembly including coating Teflon members whereby said pallet assembly moves to closed position under gravitational force, and magnetic means applying a given force to said pallet assembly toward closed position.

4,091,838

PRESSURE RELIEF VALVE

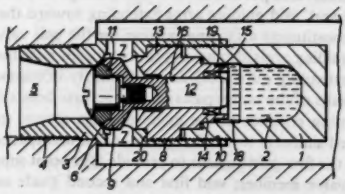
George Herbert Dowty, deceased, late of near Castletown, Isle of Man (by Marguerite Anne Gowans Dowty, personal representative); by Virginia Anne Lilley, personal representative, Malew, Isle of Man; by Lionel Barber, personal representative, St. Brelades, Islands Channel Islands, and by Peter James Kneale, personal representative, Douglas, Isle of Man, assignors to Dowty Mining Equipment Limited, England

Filed Aug. 30, 1976, Ser. No. 719,590

Claims priority, application United Kingdom, Sep. 9, 1975, 36950/75

Int. Cl.² F16K *17/02, 21/04*

U.S. Cl. 137—528 **3 Claims**



1. A fluid pressure relief valve comprising a valve closure member, a body member having a seat with which the closure member cooperates, a container fixedly connected to the body

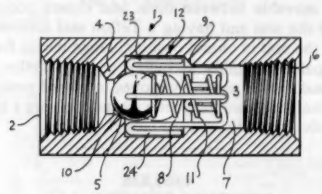
member, a quantity of liquid or liquid-like material filling the container at a predetermined preload pressure, a main plunger movable relatively to the container to change the volume and pressure of the liquid or liquid-like material therein, the pressure of the liquid or liquid-like material within the container acting on the plunger to urge the valve closure member onto the seat, an auxiliary plunger surrounding the main plunger and fixedly secured to the body member, a high pressure seal mounted within the auxiliary plunger to engage the main plunger to retain the liquid or liquid-like material within the container, an entry flow passage to the seat, and an exit flow passage from the seat, said fixed connection of the container to the body member being by way of screw-thread means whereby adjustment of the position of the container with respect to the position of the body member varies the extent by which the two plungers extend into the container and, hence, adjusts the predetermined preload pressure.

4,091,839

BALL CHECK VALVE

Verne P. Donner, Palatine, Ill., assignor to Deltrol Corp., Bellwood, Ill.

Filed Aug. 5, 1974, Ser. No. 494,749
Int. Cl.² F16K *15/04*
U.S. Cl. 137—533.13 **4 Claims**



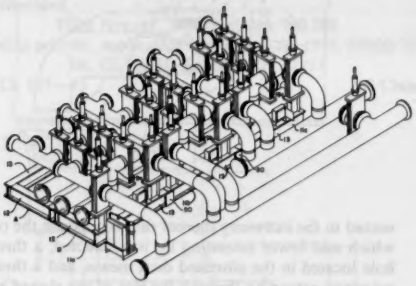
1. In a ball type check valve, the combination of, a valve body formed with inlet and outlet passages having sidewalls and separated by a ball valve seat facing the outlet passage, a ball valve member located in the outlet passage and adapted to engage and block the ball valve seat, said outlet passage adjacent the ball valve member being substantially larger than the ball valve member providing passage for fluid flow through the outlet passage around the ball valve member, guide means in the outlet passage arranged to guide the ball valve member in the outlet passage and align it with the valve seat, said guide means including a pair of spaced parallel guiding arms joined by a transverse portion in the outlet passage downstream of the valve seat, said guiding arms extending toward the valve seat and constituting a guiding portion for the ball valve member, said guiding arms also having reverse bends near the valve seat and extending outwardly and rearwardly in contact with the sidewalls of the outlet passage, said reverse bends constituting mounting portions of the guide means,a second guide means formed similarly to the first guide means and spaced angularly from the first guide means to provide four point support for the ball valve member, said first and second guide means being separate spring wire forms joined at their transverse portions, the transverse portions of each wire form part including a central loop portion extending parallel with the spaced parallel arms, said loop portions interfitting and securing the two parts together by spring tension.

4,091,840

FLOW DISTRIBUTING SYSTEM

Marvin H. Grove, Houston, and Ronald G. Dunegan, Katy, both of Tex., assignors to Daniel Valve Company, Houston, Tex.

Continuation-in-part of Ser. No. 695,071, Jun. 11, 1976, abandoned, and Ser. No. 549,180, Feb. 12, 1975, Pat. No. 3,978,707, and Ser. No. 652,998, Jan. 28, 1976. This application Aug. 30, 1976, Ser. No. 718,604
Int. Cl.² F16K *11/00*
U.S. Cl. 137—561 R **5 Claims**



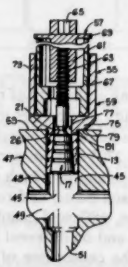
1. In a system for selectively distributing flow to and from a plurality of tanks of a tank farm, an assembly module comprising a horizontal rectangular supporting skid frame, a plurality of parallel pipes extending horizontally over and above the frame from one end of the frame to the other, the ends of the pipes being disposed in vertical planes coincident with and above the two corresponding edges of the underlying frame, one end of each pipe being adapted to be coupled to an associated liquid flow pipe, additional pipes carried by the frame and terminating above and along one side of the frame in ends adapted to be coupled to associated flow piping, said last ends being in vertical planes coincident with the corresponding edge of the frame, and a plurality of separate flow controlling means connected between a plurality of the first named pipes and a plurality of said additional pipes, each of said means being connected between one of said first named pipes and one of the additional pipes.

4,091,841

PRESSURE PLUG AND METHOD

Claus Beneker, Santa Ana, and Stanley G. La Salle, Costa Mesa, both of Calif., assignors to Bertea Corporation, Irvine, Calif.

Filed Jul. 14, 1976, Ser. No. 705,077
Int. Cl.² F16L *55/10, 55/18*
U.S. Cl. 138—89 **18 Claims**



1. A pressure plug comprising:
a sleeve having an outer peripheral surface and an inner peripheral surface, said inner peripheral surface defining a passage extending in a generally axial direction through the sleeve whereby the passage is open at both ends;

at least a portion of said inner peripheral surface of the sleeve tapering radially inwardly as it extends from a first end of the passage toward a second end of the passage;

said sleeve being radially expandable;

an inner member including a plug and an installation section joined to the plug;

said plug having an outer peripheral surface, at least a portion of said outer peripheral surface of the plug tapering radially inwardly as it extends axially from a first end of the plug toward a second end of the plug, the first end of said plug being sized to be receivable into the passage at the first end thereof and moved toward the second end thereof, the outer peripheral surface of the plug being engageable with the inner peripheral surface of the sleeve;

said second end of said passage being sufficiently open in relation to the size of the first end of the plug so as not to provide a positive stop for the movement of the plug toward the second end of the passage;

at least one of said outer peripheral surface of said plug and said inner peripheral surface of said sleeve including circumferentially extending ribs to at least assist in forming a fluid-tight seal between the outer peripheral surface of the plug and the inner peripheral surface of the sleeve;

said installation section being joined to said plug so that a tension force can be applied to the installation section to relatively axially advance the plug toward the second end of said passage to force the outer peripheral surface of the plug against the inner peripheral surface of the sleeve to radially expand the sleeve and to form a fluid-tight seal between the outer peripheral surface of the plug and the inner peripheral surface of the sleeve; and

said inner member including breakable means responsive to a particular tension load on the breakable means to allow at least a portion of the installation section to be separated from the plug.

8. A combination comprising:

a body having a cavity therein adapted to contain a fluid and a wall defining a passage leading from said cavity to the exterior of said body, said passage in said body having an outer end opening at the exterior of said body;

a sleeve having an outer peripheral surface and an inner peripheral surface, said inner peripheral surface defining a passage extending in a generally axial direction through the sleeve whereby the passage of the sleeve is open at both ends;

said sleeve being in said passage of said body;

at least a portion of said inner peripheral surface of said sleeve tapering radially inwardly as it extends axially toward the outer end of said passage of said body whereby the passage of the sleeve progressively narrows at it extends axially toward the outer end of said passage of the body;

a plug having an outer peripheral surface;

said plug being in said passage of said sleeve;

at least a portion of the outer peripheral surface of said plug tapering radially inwardly as it extends axially toward the outer end of the passage of the body whereby a first region of the plug is of larger cross sectional area than a second region of the plug;

said outer end of said passage of the sleeve being sufficiently open in relation to the size of the second region of the plug so as not to provide a positive stop for the plug;

at least one of said outer peripheral surface of said plug and said inner peripheral surface of said sleeve including circumferentially extending ribs to at least assist in forming a fluid-tight seal between the outer peripheral surface of the plug and the inner peripheral surface of the sleeve;

said plug being tightly wedged into the passage of said sleeve with the outer peripheral surface of the plug tightly engaging the inner peripheral surface of the sleeve and with the plug holding the sleeve in a radially expanded condition in which the outer peripheral surface of the plug tightly engages the wall of the body which defines the passage in the body; and

said plug having a broken off outer end which has been broken off from an external member.

13. A method of sealing a passage in a body wherein the passage is defined by a wall of the body, leads from a cavity in the body to the exterior of the body, and has an outer end opening at the exterior of the body, said method comprising:

providing a radially expandable sleeve having an outer peripheral surface and an inner peripheral surface with the inner peripheral surface defining a passage extending in a generally axial direction through the sleeve;

providing an inner member which includes a plug and an installation section with the plug having an outer peripheral surface, at least a portion of at least one of said outer peripheral surfaces of said plug and said inner peripheral surface of said sleeve tapering radially as it extends axially, said installation section having a breakable section;

placing the plug in the passage of the sleeve and the sleeve in the passage of the body with said portion of said one surface tapering radially inwardly as it extends toward the outer end of the passage in the body and with the installation section projecting out of the sleeve and out of the outer end of the passage of the body;

pulling on the installation section with a tool in a direction generally axially outwardly of the passage of the body to wedge the plug tightly in the passage of the sleeve and to radially expand the sleeve into tight engagement with the wall of the body which defines the passage of the body to thereby seal the passage of the body, said step of pulling on the installation section providing a pulling force on the sleeve tending to withdraw the sleeve from the passage of the body and providing a reaction force on the tool;

utilizing at least some of said reaction force to restrain the sleeve against the pulling force;

continuing said step of pulling until the breakable section breaks to separate at least a portion of the installation section from the plug;

said tool including a shoulder and a projection projecting from the shoulder and the body having an external surface in which the passage of the body terminates;

placing the shoulder against the external surface of the body and placing the projection in the passage of the body;

engaging one end of the sleeve with the projection to axially position the sleeve in the passage of the body; and

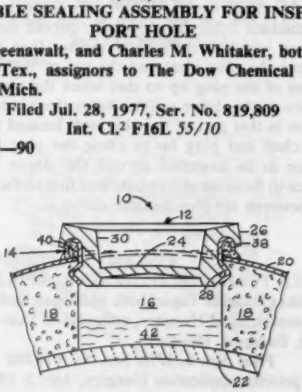
said step of utilizing including passing at least some of the reaction force through said projection to said sleeve for use in counteracting the pulling force on the sleeve.

4,091,842

RESEALABLE SEALING ASSEMBLY FOR INSPECTION PORT HOLE

Eddie L. Greenawalt, and Charles M. Whitaker, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 28, 1977, Ser. No. 819,809
Int. Cl.[2] F16L *55/10*
U.S. Cl. 138—90 **5 Claims**



1. A resealable sealing assembly located in a cylindrically shaped inspection hole cut in skin-covered insulation, said assembly being comprised, in combination, of:

a. a cylindrically shaped plug made from an elastomeric material,

which plug is hollow except for a diaphragm connecting the interior wall of the plug to prevent fluid passage through the interior the plug, the diaphragm being located at any convenient location along the interior of the plug wall,

which plug has an annular lip which extends outwardly from the top of the plug wall and which lip's downward side is concavely curved upward with a predetermined radius,

which plug has an annular cleat protruding outwardly from the side the plug side wall at a predetermined distance from the top of the upward curve of the bottom of the annular plug lip, and which cleat has a predetermined diameter; and

b. a rigid cylindrically shaped, hollow sleeve into and over which the elastomeric plug is capable of being positioned,

said sleeve having an annular lip extending outwardly at the sleeve top and an annular bulge protruding outwardly in the sleeve wall,

said sleeve being located within the hole cut in the insulation with the exception of the sleeve lip which extends outwardly from the top of the sleeve over that skin-covered insulation which immediately surrounds the hole, the bottom of the sleeve lip being attached to the top of the skin-covered insulation by an adhesive-sealant forming both a weatherproof seal and a first anchoring connection between the sleeve and the insulation,

the sleeve lip having a convex-upwardly curved portion on its upper side, which curved portion has a radius of curvature greater than the radius of curvature of the concave-upwardly curved downward side of the plug lip so that the elastomeric plug lip is stretched sufficiently around the convex-upwardly curved portion of the rigid sleeve lip to form a first surface-to-surface seal between the plug and the sleeve when the plug is in position in and over the sleeve,

the enlarged annular bulge of the sleeve formed in the sleeve wall protruding sufficiently outwardly into the insulation surrounding the sleeve wall to form a second anchoring connection between the sleeve and the insulation by compression of the insulation adjacent to the annular bulge, said compression causing compression forces to be exerted on the sleeve by the insulation to assist in holding the sleeve stationery with respect to the insulation,

the annular bulge having an inside diameter sufficiently less than the outside diameter of the plug cleat so that when the plug cleat is in position in the sleeve annular bulge a second surface-to-surface seal is formed between the sleeve and the plug due to the compression of the plug cleat within the sleeve annular bulge,

the location of the annular bulge being down the sleeve wall at a distance from the top of the curved sleeve lip at a distance which is sufficiently greater than the distance between the plug cleat and the top of the curve in the bottom of the plug lip so that when the plug cleat is in position in the sleeve annular bulge there exists sufficient tension in that part of the plug wall located between the plug cleat and plug lip to cause the plug lip's curved surface to be stretched around the sleeve lip's curved surface to form the aforementioned first surface-to-surface seal between the plug and the sleeve.

4,091,843

FLEXIBLE TUBES FOR HYDRAULIC APPLICATIONS

Sandor Mikes; Matyas Timar, both of Szeged, and Zoltan Bartha, Budapest, all of Hungary, assignors to Taurus Gumiipari Vallalat, Budapest, Hungary

Filed Apr. 5, 1976, Ser. No. 673,540

Claims priority, application Hungary, Apr. 3, 1975, TA 1354

Int. Cl.[2] F16L *11/08*

U.S. Cl. 138—127 **1 Claim**

1. As a new article of manufacture, a flexible composite tube comprising a core formed from ethylene-propylene-terpolymer rubber, a first transition layer bonded to the exterior surface of the core and formed from a textile selected from the group consisting of rayon, polyamide, polyester and cotton impregnated with a bond-increasing agent selected from the group consisting of polychlorophene and natural rubber and embedded within a first mixture containing about 50–80% ethylene-propylene-terpolymer rubber and the remainder selected from the group consisting of polychloroprene and natural rubber, the first mixture in the first transition layer being in contact with the underlying exterior surface of the core, a load-bearing layer bonded to the exterior surface of the first transition layer and in contact with the first mixture in the underlying first transition layer, the load-bearing layer consisting of a metal insert embedded within an adherent substance selected from the group consisting of polychloroprene and natural rubber, a second transition layer bonded to the exterior surface of the load-bearing layer and formed from a textile selected from the group consisting of rayon, polyamide, polyester and cotton impregnated with a bond-increasing agent selected from the group consisting of polychlorophene and natural rubber and embedded within a second mixture containing about 50–80% ethylene-propylene-terpolymer rubber and the remainder selected from the group consisting of polychloroprene and natural rubber, the second mixture in the second transition layer being in contact with the exterior surface of the underlying load-bearing layer, and an outer jacket bonded to the exterior surface of the second transition layer and in contact with the second mixture in the second transition layer, the outer jacket being formed from ethylene-propylene-terpolymer rubber.

4,091,844

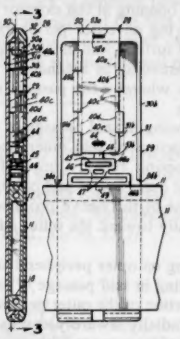
LOOM HARNESS

James L. Underwood, Woodstock, Ga., assignor to Pioneer Heddle and Reed Company Incorporated, Atlanta, Ga.

Filed Feb. 25, 1977, Ser. No. 771,938

Int. Cl.[2] D03C *9/06*

U.S. Cl. 139—91 **20 Claims**



1. An element of a protective attachment which cooperates with a similar element thereof to form said protective attachment for surrounding the rail of a heddle frame comprising:

(a) a panel of a vertical length greater than the width of said rail;

(b) means for securing one end portion of said panel to a similar end portion of an opposed similar panel of a similar element; and

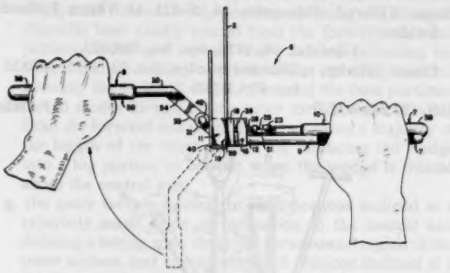
(c) detent means for releasably securing the other end portion of said panel to the other end portion of said similar panel, said detent means including a transversely extending block protruding from the inner surface of said panel toward said similar panel, said block being provided with an opening therein which is for alignment with a similar opening, of a similar block on said similar element when the two elements surround said rail.

4,091,845

HANGER WIRE BENDER

Larry R. Johnson, 1501 Holland Ct., Independence, Mo. 64058

Filed Apr. 7, 1977, Ser. No. 785,340
Int. Cl.[2] B21F 1/00
U.S. Cl. 140—106 3 Claims



1. A bending tool for forming a wire hanger comprising:

(a) a pair of coordinating, pivotally mounted, elongated gripping handles operably connected to a jaw formed in a block member, said block member having an open channel extended therein and aligned normally to said handles, one of said handles being operably connected to an elongated bar positioned in said channel and reciprocably movable normal to said channel in response to movement of said handles to grip a wire to be formed;

(b) said block member having at least two right angle corners with a wire position locating flat facing portion extending therebetween, a first said corner being at an outlet portion of said channel and a second said corner being proximately located from said first corner and spaced therefrom by said facing portion; and

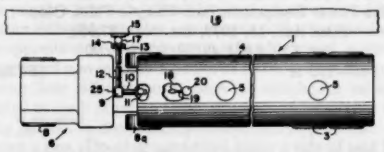
(c) a third coordinating bending handle pivotally mounted on said block member by an axial connection means positioned on a line extending generally normally between said first and second corners, said bending handle having a wire contacting protuberance extended therefrom at a point proximately located and generally equidistant to said first and second corners when said bending handle is pivoted whereby a pair of precisely spaced right angle bends with a straight portion therebetween may be formed in a wire at a selected position determined by said facing portion.

4,091,846

FLUID TRANSFER METHODS AND APPARATUS

Paul P. Legleiter, 321 S. Hazel, Gaylord, Mich. 49735

Filed Jan. 5, 1977, Ser. No. 756,961
Int. Cl.[2] B65B 3/12
U.S. Cl. 141—1 12 Claims



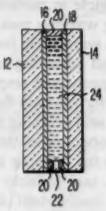
1. Apparatus for transferring fluid from a reservoir to a mobile truck-mounted transport tank having therein a float operable to rise and fall in response to changes in the level of fluid in said tank, said apparatus comprising conduit means in communication with said tank; means for separably connecting said conduit to said reservoir; a pump in connection with said conduit means; drive means for driving said pump; an energy source; coupling means operable only when energized by said energy source to couple said driving means to said pump; and adjustable switching means in circuit with said energy source and said coupling means, said switching means in one position thereof being responsive to the level of said float to enable energization of said coupling means by said energy source only when said float is at a level below a predetermined higher level, and said switching means in a second position thereof enabling energization of said coupling means by said energy source regardless of the level of said float.

4,091,847

PROCESS FOR FILLING DYNAMIC SCATTERING LIQUID CRYSTAL CELLS

Howard Sorkin, Berkeley Heights, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 22, 1976, Ser. No. 744,127
Int. Cl.[2] G02F 1/13; C09K 3/34; B65B 31/04
U.S. Cl. 141—7 6 Claims



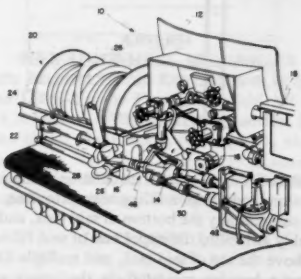
1. In the process whereby a dynamic scattering liquid crystal cell comprising a layer of liquid crystal composition having negative dielectric anisotropy between two electrodes is filled from a single fill port by evacuating said cell, immersing said evacuated cell in a solution of an ionic dopant in a volatile solvent to fill the cell with said solution, evaporating the solvent leaving a film of said dopant on the walls of the cell, evacuating the cell and filling said inner-coated evacuated cell by immersing it in a dynamic scattering liquid crystal composition containing an ionic dopant, the improvement which comprises employing as the ionic dopant in both the volatile solvent and the liquid crystal composition the same-- has been substituted therefor, mixture of at least two ionic dopants having different ions.

4,091,848

SAFETY WARNING SYSTEM FOR AN LP GAS TRANSPORT VEHICLE

Hedrick M. Phillips, 905 Merwin Rd., Raleigh, N.C.

Filed Apr. 16, 1975, Ser. No. 568,513
Int. Cl.[2] B65B 57/18
U.S. Cl. 141—94 8 Claims



1. In a LP gas transport vehicle or the like of the type having a tank mounted thereon and having opening means operatively associated therewith for filling the tank, the improvement comprising a safety warning system for appraising the operator

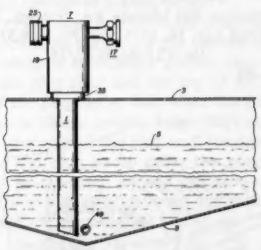
of the vehicle of the presence of a hose connection between said opening means operatively associated with said vehicle tank and a second tank, said safety warning system comprising: obstacle means associated with said tank on said vehicle and normally disposed in a position of obstruction adjacent said opening means operatively associated with said tank on said vehicle so as to prevent the connection of hose means between a second tank and said opening means associated with said vehicle tank and to prevent even the presence of a hose connection between a second tank and said opening means associated with said tank on said vehicle, said obstacle means being movable from said normal position of obstruction to a filling position where the area adjacent said vehicle tank opening means is relatively unobstructed and hose means can be conveniently operatively coupled and connected between said opening means associated with said tank of said vehicle and said second tank; signaling means disposed in the vicinity of the vehicle's cab where the same is readily discernible by an operator about to start the vehicle in motion, said signaling means including communicating warning means for directly communicating to the operator a warning in response to said signaling means being actuated; and actuating means operatively connected to said signaling means and responsive to said obstacle means assuming said filling position for selectively actuating said signaling means and said warning means thereof and consequently appraising the operator of the presence of a possible hose connection between the opening means operatively associated with the tank on said vehicle and said second tank, thereby preventing the inadvertent moving of the vehicle while there is a hose connection between the tank on aid vehicle and said second tank, wherein said vehicle includes a delivery hose reel assembly having a delivery hose and nozzle segment forming a nozzle end, and wherein a portion of said hose and nozzle segment comprises said obstacle means such that said hose and nozzle segment normally assumes a position of obstruction adjacent said opening means formed within the tank mounted on said vehicle so as to prevent the connection of hose means from said second tank with said opening means formed within the tank on said vehicle.

4,091,849

SAFE TANK FILLING APPARATUS

James S. Stevenson, Oakland, Calif., assignor to Terminator Products, Inc., Oakland, Calif.

Filed Feb. 22, 1977, Ser. No. 770,366
Int. Cl.[2] B65B *3/04*
U.S. Cl. 141—302 **10 Claims**



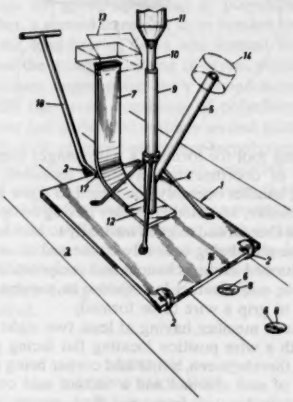
1. A safe tank-filling apparatus installation comprising a tank having a bottom and a top, a filling tube extending down into said tank to substantially the bottom of said tank, and a multiple valve assembly affixed to the upper end of said filling tube and extending above the top of said tank, said multiple valve assembly including a housing mounted on the upper end of said filling tube, said housing including a flow passageway in communication with said filling tube, a fill valve assembly in said flow passageway adapted to permit flow to said filling tube but block reverse flow in said passageway, a vent in said housing and normally open valve means at said vent and responsive to liquid in said housing for blocking said vent during presence of such liquid.

4,091,850

APPARATUS FOR ATTACHING ROOF INSULATING SHEETS AND SIMILAR OBJECTS

Birger Kjölsrud, Pianogatan 16, S-421 44 Västra Frölunda, Sweden

Filed Jul. 19, 1976, Ser. No. 706,493
Claims priority, application Sweden, Jul. 23, 1975, 750833
Int. Cl.[2] B25B *23/00*
U.S. Cl. 144—32 R **7 Claims**



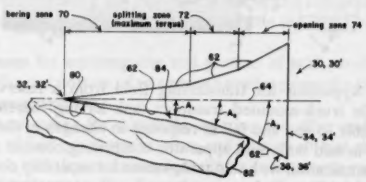
1. An improved apparatus for attaching sheets, such as insulating sheets of mineral wool to a substratum, such as profiled sheet metal, by using centrally apertured washers and screws, the improvement comprising a portable flat frame adapted to be conveyed across said substratum, said frame carrying washer gravity feed means attached to and extending upwardly therefrom for sequentially feeding washers to the points of attachment, a tube-like screw gravity feed means attached to said frame and extending upwardly therefrom for feeding one screw at a time to a washer deposited in place by said washer gravity feed means at the points of attachment, and means carried by said frame and arranged to drive said screws through said centre aperture formed in said washers, down into and through said insulating material and into said substratum.

4,091,851

LOG SPLITTING APPARATUS

Howard R. Ober, Chagrin Falls, Ohio, assignor to Trans-America Power Equipment, Inc., Chagrin Falls, Ohio

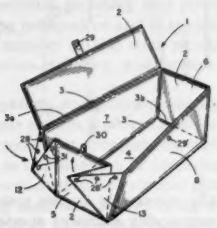
Filed Apr. 15, 1977, Ser. No. 787,951
Int. Cl.[2] A47J *49/02*; B27L *7/00*
U.S. Cl. 144—193 R **16 Claims**



1. A portable log splitting apparatus, comprising:
a. a frame supported on wheels;
b. a power source carried on the frame;

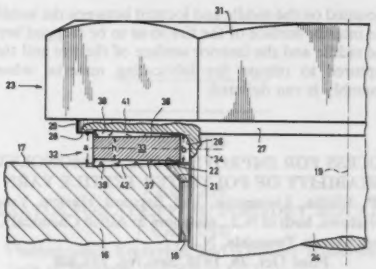
c. a screw-shaped wedge supported on the frame for rotation about a central axis;
d. a drive system for selectively drivingly coupling the power source and the wedge to rotate the wedge about the central axis;
e. the wedge having portions which are substantially symmetrical about the central axis including portions defining a pointed forward end, portions defining an enlarged diameter base axially spaced from the forward end, and portions defining a tapered outer surface extending between and providing a substantially smooth transition between the forward end portions and the base portions;
f. thread means formed on the outer surface and extending from the forward end portions at least along a majority of the length of the outer surface for threading the wedge into a log portion to be split when the wedge is rotated about the central axis;
g. the outer surface having forward portions inclined at a relatively small angle of inclination to the central axis defining a boring zone along the forward end region of the outer surface, and having rearward portions inclined at a relatively larger angle of inclination to the central axis defining an opening zone along the rearward end region of the outer surface; and,
h. the outer surface additionally including a splitting zone located intermediate the boring and opening zones and having outer surface portions which are inclined at an angle to the central axis intermediate the magnitudes of the angles of inclination of the forward and rearward portions.

4,091,852
INFLATABLE BOX
Charles P. Jordan, 203 Fairlane Dr., and Claire L. McGuire, 2614 Fairway Dr., both of Joliet, Ill. 60435
Filed Apr. 11, 1977, Ser. No. 786,353
Int. Cl.[2] A45C *7/00*
U.S. Cl. 150—.5 **6 Claims**



1. An inflatable container, comprising a plurality of waterproof inflatable panels, including a bottom inflatable panel, a first end inflatable panel adjacent one end of said bottom inflatable panel, a first side inflatable panel adjacent one side of said bottom inflatable panel, a second side inflatable panel adjacent the opposite side of said bottom inflatable panel, a plurality of waterproof non-inflatable panels of flexible sheet material each having four sides adjacent ones of which are substantially normal to each other and opposite ones of which are substantially parallel to each other, a first of said non-inflatable panels having a first side edge connected along a side of said first end inflatable panel and a second side edge connected along an adjacent side of said first side inflatable panel, a third side edge of said first non-inflatable panel including first fastener means thereon for cooperative fastening engagement with second fastener means, a second of said non-inflatable panels having a first side edge connected along an opposite side of said first end inflatable panel and a second side edge connected along an adjacent side of said second side inflatable panel, a third side edge of said second non-inflatable panel including said second fastener means thereon for cooperative fastening engagement with said first fastener means when said bottom, side and end inflatable panels are folded into a box configuration, said first non-inflatable panel is triangularly folded on itself and folded against said first end inflatable panel, said second non-inflatable panel is triangularly folded on itself and folded against said first non-inflatable panel whereupon said first and second fastener means come into registration with each other for fastening engagement together.

4,091,853
SCREW-LOCKING DEVICE
Peter Bühl, Zeppelinstr 35, 7032 Sindelfingen, Germany
Filed Apr. 14, 1976, Ser. No. 676,810
Int. Cl.[2] F16B *39/24*
U.S. Cl. 151—35 **3 Claims**



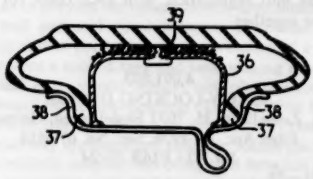
1. A screw-locking device comprising a stamped cup spring of the Belleville type of spring metal having a solid annular core region of substantially frusto-conical configuration with an outer rim, an inner rim, a top side, a bottom side and approximately radial ribs arranged close to one another at regular intervals on at least a portion of both the top side and the bottom side, which ribs are of approximately triangular cross section,
the cross section of the core region having a center plane,
perpendicular to the center plane of the core region, the distance of the peaks of the ribs from the center plane in the area of the outer rim is appreciably greater than the distance in the area of the inner rim and this distance continually decreases from the outer rim area towards the inner rim area,
the ribs extending to the outer rim to provide the highest portions of the device relative to the center plane in the area of the outer rim
at least a portion of the ribs on the top side lying approximately above the ribs on the bottom side, at least in the area of the outer rim.

4,091,854
TIRE AND WHEEL ASSEMBLIES
Tom French; Reginald Harold Edwards, both of Sutton Coldfield, and Leslie Vernon Powell, Lichfield, all of England, assignors to Dunlop Holdings Limited, London, England
Division of Ser. No. 629,522, Nov. 6, 1975, which is a continuation of Ser. No. 150,627, Jun. 7, 1971, abandoned. This application Jun. 22, 1976, Ser. No. 698,513
Claims priority, application United Kingdom, Jun. 20, 1970, 30027/70
Int. Cl.[2] B60C *5/12*
U.S. Cl. 152—158 **2 Claims**

1. A pneumatic tire and wheel assembly capable of being run in a deflated condition comprising:
(a) a tire having a tread area and a pair of sidewalls defining an interior surface, and a wheel upon which the tire is mounted to define therewith an inflation chamber, said wheel having a rim with a pair of opposed annular flanges

and a saddle, located between the rim flanges, extending into a radially outwardly position on the rim base, and

(b) a completely closed rupturable enclosing means, containing lubricating material for the interior surface of the tire,



mounted on the saddle and located between the saddle and the interior surface of the tire so as to be trapped between the saddle and the interior surface of the tire and thereby ruptured to release the lubricating material when the assembly is run deflated.

4,091,855

PROCESS FOR IMPROVING THE AMMONOLYTIC STABILITY OF POLYESTER TEXTILE YARN

John P. Sibilia, Livingston, and Bernard Harlow Vrooman, Morristown, both of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Oct. 26, 1976, Ser. No. 735,308
Int. Cl.[2] D02G *3/48*
U.S. Cl. 152—359 **12 Claims**

1. A process for improving the ammonolytic stability of polyester textile yarn without substantial loss of its tensile strength which comprises:

(a) separating fibers of the yarn being processed at a speed of at least about 100 feet per minute;

(b) exposing the fibers to a zone of corona discharge for a total of about 0.01 to 3 seconds while passing the fibers through the discharge zone at the aforesaid speed; and

(c) collecting the fibers at the aforesaid speed to reform the yarn.

4,091,856

TIRE HAVING ANNULAR REINFORCING STRUCTURE AND COMPRESSED RUBBER HOOP

William Lewis Jackson, Birmingham, England, assignor to Dunlop Limited, London, England

Continuation of Ser. No. 553,104, Feb. 26, 1975, abandoned. This application Sep. 1, 1976, Ser. No. 719,525
Claims priority, application United Kingdom, Feb. 26, 1974, 08566/74
Int. Cl.[2] B60C *7/22, 9/18*
U.S. Cl. 152—361 R **7 Claims**

1. A pneumatic tire comprising:

a tread portion of elastomeric material,

sidewall portions,

an annular reinforcing belt bracing said tread portion, said belt being substantially axially coextensive with said tread portion, being immediately radially inwardly thereof, and being substantially inextensible in both its circumferential and transverse directions, and

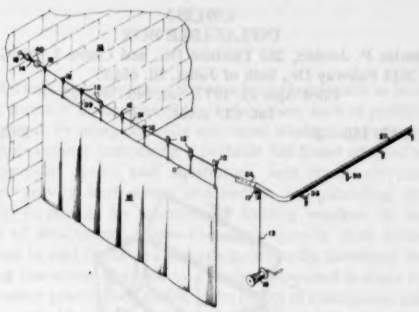
a hoop of pre-compressed rubber radially inwardly of said annular reinforcing belt which hoop, in the unloaded and uninflated state of the tire, is maintained in a compressed condition by the equal and opposite tension in the annular reinforcing belt, said hoop being beneath the tread portion only, and being substantially axially coextensive with the tread portion.

4,091,857

CABLE-SUSPENDED DRAW-CURTAIN SYSTEM

Lawrence O'Quinn Jacobs, Richmond, Va., assignor to Plastic Products, Inc., Richmond, Va.

Filed Jul. 5, 1977, Ser. No. 812,889
Int. Cl.[2] A47H *1/19*
U.S. Cl. 160—330 **6 Claims**



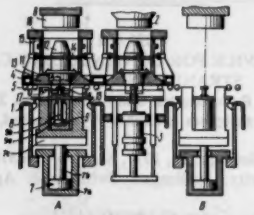
1. A horizontally traversable curtain system comprising a tensioned cable removeably anchored at one end and having tensioning means at its opposite end, and arranged so that a portion thereof is disposed as a horizontally oriented span between said anchored end and a guide means which redirects said cable to said tensioning means, an aligned plurality of carriers engaging the upper portion of said cable for traversing movement with respect thereto, a flexible curtain having a straight upper edge and pendantly supported by said edge held at spaced points by attachment to portions of said carriers disposed below said cable, an inclined transfer means positioned above said cable at that extreme of said horizontal span adjacent said guide means, the lower terminus of said transfer means being directed toward said anchored end and adapted to transversely straddle said cable, the upper terminus of said transfer means engaging with the forward end of a rigid storage track which is initially coextensive with said cable, the disposition and interaction of said transfer means and said storage track being such as to provide a transition region wherein said carriers disengage from said cable, said transition region being located above said horizontal span and between the lower terminus of said transfer means and said guide means whereby said carriers are transferred from said cable onto said storage track.

4,091,858

APPARATUS FOR MAKING MOLDS BY SEQUENTIAL SQUEEZING

Grigory Mikhailovich Goldring, ulitsa Zernovaya, 6/6 kv. 57; Semen Nusievich Koiler, prospekt 50-letia VLKSM, 67, kv. 47; Vladimir Fedorovich Losev, 531 mikroraion, ulitsa Shironintsev, 50v, kv. 12; Vladimir Danilovich Pepenko, Proviantsky pereulok, 1a, kv. 51; Evgeny Ivanovich Platov, ulitsa Anri Barbjusa, 3, kv. 14, all of Kharkov; Benedikt Veniaminovich Rabinovich, ulitsa Vavilova, 48, kv. 401, Moscow, and Jury Viktorovich Sakhanovich, prospekt Frunze, 22, kv. 9, Kharkov, all of U.S.S.R.

Filed Nov. 12, 1974, Ser. No. 523,063
Int. Cl.[2] B22C *15/08, 17/06*
U.S. Cl. 164—212 5 Claims



1. Apparatus for making molds by sequential squeezing, said apparatus having a frame provided with at least one station for molding sand compaction, comprising:

a main squeeze cylinder mounted on said frame and including a movable power member mounted therein;

a top traverse and squeeze board provided opposite to the main squeeze cylinder to cooperate with the squeeze cylinder to compact sand in an assembly of flask and pattern accessories provided therebetween;

an auxiliary actuating mechanism including a power cylinder and a pedestal enclosing said power cylinder, said pedestal being mounted on and in tandem with said movable power member of said main squeeze cylinder, said power cylinder including a movable piston mounted therein;

said flask-and-pattern accessories consisting of an independently movable pattern, a pattern plate having said pattern mounted thereon, a stripper plate movable with respect to said pattern in the direction of squeezing, a flask with a filling frame mounted on said stripper plate for being filled with molding sand, said pattern being movable independently of the other parts of said flask-and-pattern accessories;

a sectional lock type clamping means for operatively clamping said movable piston of said power cylinder of said auxiliary actuating mechanism to said pattern, said clamping means comprising a clamping mushroom member connected with said movable piston of said power cylinder and a lug connected with said movable pattern, said clamping mushroom and said lug operatively connecting said movable piston with said independent movable pattern for the independent movement thereof along an axis common to said pattern and said movable piston and defining an axis of squeezing;

said auxiliary actuating mechanism being associated with said flask-and-pattern accessories for movement thereof so that when said pedestal moves, the flask-and-pattern accessories approach said squeeze board to carry out a mold squeezing operation;

stop means supported on said frame for supporting said movable piston of said power cylinder, said sectional lock type of clamping means enabling said auxiliary actuating mechanism and said pattern to be quickly connected and disconnected, and said stop means supporting said auxiliary actuating mechanism when the latter is disconnected from said pattern;

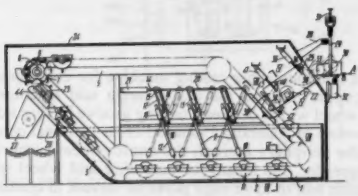
said movable power member and said movable piston having a common axis coinciding with the axis of squeezing, and said main squeeze cylinder during its preliminary stroke taking all transport clearances in said sectional lock type clamping means and the clearance between said pedestal and said pattern plate, said power cylinder during the mold squeezing operation moving in the direction of said top transverse and squeeze board to squeeze the molding by means of said stripper plate and together with said clamping means fixes said pattern relative to the frame, and upon completion of the mold squeezing operation said power member being lowered to support said auxiliary actuating means on said stop means to disconnect said clamping mushroom from said lug.

4,091,859

APPARATUS FOR STRIPPING FOUNDRY MOULDS OF CASTING

Boris Vladimirovich Kostyrkin, and Vladimir Ivanovich Schekin, both of Nikolaev, U.S.S.R.

Filed Dec. 16, 1976, Ser. No. 751,527
Int. Cl.[2] B22D *29/04*
U.S. Cl. 164—250 2 Claims



1. An apparatus for stripping foundry molds off castings by using high-voltage electrical discharges in a fluid, comprising:

a fluid bath tank wherein castings undergo treatment;

a conveyor having at least a portion extending into said tank for continuous feeding of castings into said bath tank;

containers mounted on said conveyor and used to receive castings therein;

a means adjacent said conveyor for charging castings into said containers;

a means adjacent said conveyor for discharging said castings from said containers;

a plurality of electrode assemblies secured above said bath tank and used as a means for effecting high-voltage electrical discharge in said fluid, the number of said electrode assemblies being equal in number to the number of castings simultaneously present on said conveyor in a treatment zone;

rods positioned on both sides of said containers;

clamps arranged on said rods for holding said castings;

springs encompassing said rods and forcing said clamps to grip a casting;

toothed racks arranged in said bath tank lengthwise of the travel of said conveyor; and

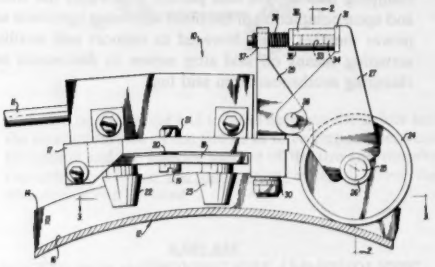
gear wheels arranged on said rods and brought into engagement with said toothed racks to vary the position of a casting in relation to the ends of said electrode assemblies.

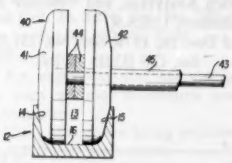
4,091,860

WHEEL SPREADER AND CRACK CLOSER

Milton E. Berry, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Division of Ser. No. 211,233, Dec. 23, 1971, Pat. No. 3,834,444.
This application Oct. 19, 1973, Ser. No. 407,889
The portion of the term of this patent subsequent to Sep. 10, 1991, has been disclaimed.
Int. Cl.[2] B22D *11/06*
U.S. Cl. 164—433 3 Claims





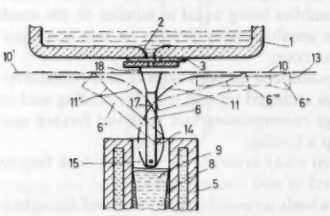
3. In a continuous bar casting machine for continuous casting of copper bar and the like wherein said machine has a casting wheel which defines a casting groove having sidewalls and a bottom of generally U-shaped cross-sectional configuration in the periphery thereof, the improvement comprising, a wheel spreader, and means for mounting said wheel spreader for rotation and to have edge portions thereof in contact with said sidewalls of the peripheral groove to inhibit movement of said sidewalls toward one another and closing the groove.

4,091,861

APPARATUS FOR EXCHANGING POURING TUBES AT CASTING VESSELS OF CONTINUOUS CASTING INSTALLATIONS

Armin Thalmann, Uster, and Josef Zeller, Weesen, both of Switzerland, assignors to Concast AG, Zurich, Switzerland

Filed Mar. 2, 1977, Ser. No. 773,472
Claims priority, application Switzerland, Mar. 9, 1976, 2892/76
Int. Cl.[2] B22D *41/08*
U.S. Cl. 164—437 11 Claims



1. An apparatus for exchanging pouring tubes at a casting vessel having a closeable bottom pour outlet of a continuous casting installation, each pouring tube having an infeed end and outfeed end for the molten metal to be teemed, wherein each pouring tube when assuming its casting position extends substantially vertically with its outfeed end immersed in a throughflow vessel, said apparatus comprising:

guide means providing different paths of travel for the infeed end and outfeed end of the pouring tubes moved from an approximately horizontal pouring tube-infeed position into an approximately vertical casting position;

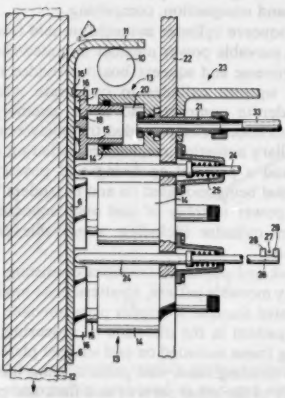
said different paths of travel comprising a substantially horizontal path of travel for the infeed end of each pouring tube and a substantially vertical path of travel in a vertical plane for the outfeed end of each pouring tube, and wherein at least part of the vertical path of travel in said vertical plane extends within the throughflow vessel.

4,091,862

GUIDING DEVICE FOR CONTINUOUSLY CAST METAL STRANDS AND THE LIKE

Rolf Lehmann, Rudolfstetten, and Alfred Christ, Zurich, both of Switzerland, assignors to Escher Wyss Limited, Zurich, Switzerland

Filed Apr. 11, 1977, Ser. No. 786,370
Claims priority, application Switzerland, Apr. 13, 1976, 4666/76
Int. Cl.[2] B22D *11/12*
U.S. Cl. 164—447 33 Claims



30. An apparatus for guiding castings such as continuously cast metal strands which comprises at least two guide plates for supporting the casting therebetween, a support frame, a plurality of hydrostatic support elements arranged on said frame to exert support forces on each guide plate, each of said support elements including a cylinder and a piston guided by said cylinder in a direction generally perpendicular to the plane of the associated plate and mounted for pivoting about the axis of said cylinder, said piston defining with said cylinder a chamber therebetween, means for supplying fluid under pressure to each chamber for urging said pistons toward said guide plates, each piston having a bearing portion on the end thereof adjacent the respective guide plate, a plurality of recesses formed in said bearing portion and a separate restrictor duct connecting each recess with the associated chamber for supplying fluid from said chamber to said recesses at a substantially constant rate with respect to time, said bearing portions each having a greater hydrostatically effective area than the effective area of the respective piston exposed to pressure in the associated chamber so that the fluid discharging from said recesses through narrow gaps formed between the respective bearing

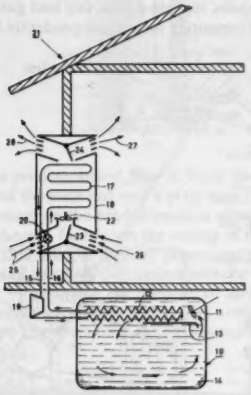
portions and the guide plates forms hydrostatic support for and cools said plates.

4,091,863

REVERSIBLE LATENT HEAT STORAGE METHOD, AND REVERSIBLE LATENT HEAT ACCUMULATOR

Johann Schroder, Aachen, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 14, 1976, Ser. No. 676,718
Claims priority, application Germany, Apr. 23, 1975, 2517921
Int. Cl.[2] F25D *3/00*; F24H *7/00*; F25D *11/00*; F28F *23/02*
U.S. Cl. 165—1 6 Claims



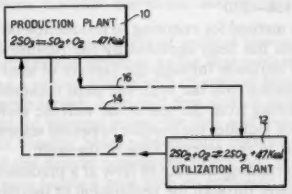
1. A method of utilizing latent heat stored in a crystallizable liquid heat storage medium subject to super-cooling, which comprises providing a body of said storage medium in an enclosed space associated with a heat exchanger and having a bed of seed crystals in the lower portion thereof, maintaining the heat exchanger at a temperature below the melting point of the storage medium, continuously circulating the storage medium past the heat exchanger to effect super-cooling thereof and past the seed crystal bed to effect partial crystallization thereof and back past the heat exchanger, and maintaining the flow rate of the storage medium past the heat exchanger at a sufficiently high value so that no or substantially no crystallization of the storage medium occurs near the heat exchanger and no or substantially no crystals are formed on the heat exchanger.

4,091,864

PROCESS FOR THE CONVERSION, CONVEYANCE AND UTILIZATION OF ENERGY

Gioacchino Cocuzza, Catania, and Giorgio Beghi, Varese, both of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed May 12, 1976, Ser. No. 685,608
Claims priority, application Italy, May 13, 1975, 23257/75
Int. Cl.[2] F28D *15/00*
U.S. Cl. 165—1 3 Claims



1. A process for the conversion, conveyance and utilization of energy in a closed cycle in which thermal energy is converted, in a production plant, into chemical dissociation energy by dissociating sulfur trioxide according to the reaction:

$$2SO_3 \rightleftarrows 2SO_2 + O_2,$$

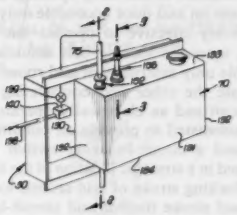
the dissociation products of the reaction are conveyed to a utilization plant in which they are recombined into sulfur trioxide, with release of the stored chemical energy as heat, the resulting sulfur trioxide being returned to the production plant, and in which the sulfur dioxide and the sulfur trioxide are conveyed from the production plant to the utilization plant and from the utilization plant to the production plant respectively in liquid form wherein the liquid sulfur dioxide and sulfur trioxide are conveyed through pipes which are surrounded by a duct in which the gaseous oxygen flows.

4,091,865

AIR-PRESSURIZED, SAFETY ANTI-FREEZE TANK

John A. Babish, Glendora; Larry K. Arnot, Duarte, and Douglas C. Appel, Glendora, all of Calif., assignors to Wynn Oil Company, Fullerton, Calif.

Continuation-in-part of Ser. No. 741,065, Nov. 11, 1976. This application Jul. 14, 1977, Ser. No. 815,571
Int. Cl.[2] F28G *9/00*
U.S. Cl. 165—95 8 Claims



1. For use in combination with an internal combustion engine cooling system and means to produce a pressurized flow of flushing fluid to flush said system, said means including a source of pressurized gas, the improvement assembly comprising

(a) a coolant fluid container consisting of plastic material operatively connectible to said source of pressurized gas via a pressure regulator, and tubing downstream of said regulator,

(b) the container having an inlet to pass said gas into the container to pressurize coolant therein,

(c) there being a flow restrictor means in the tubing and connected in series with and located proximate to said inlet to limit the rate of gas flow into the container thereby to inhibit inadvertent bursting of the container,

(d) the container having an outlet communicable with said cooling system to pass pressurized coolant solution thereto,

(e) and a safety valve connected to said tank to release excessive pressure therein, said valve located in such proximity to said inlet, and said flow restrictor means sized in such relation to the volumetric release capacity of said safety valve, as to prevent excess insurging of gas flow into the container that would raise the pressure therein to burst levels,

(f) the restrictor means defining a reduced bore that limits the inflow of pressurized gas to about the same CFM rates when the pressure in said tubing varies between 10 and 50 psi.

4,091,866

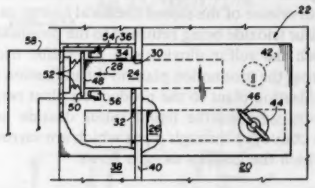
COMBINATION DOOR LOCK AND ELECTRICAL SWITCH

Frank Curatolo, 130 Overlook Ave., Hackensack, N.J. 07602

Filed Nov. 19, 1976, Ser. No. 743,174

Int. Cl.[2] F24F *1/00*; E05B *37/12*; H01H *27/06*

U.S. Cl. 165—138 **3 Claims**



1. For advantageous use for a hotel room having a door adapted to be locked for security purposes and an electrically operated air conditioner for cooling said room, a combination door lock and switch for terminating the operation of said air conditioner comprising wall means of said room bounding a door opening, a door pivotally mounted in said door opening, a lock mounted in the pivotally traversable edge of said door, first and second slidably disposed locking bolts of said lock each operatively arranged for sliding movement from a clearance position through a locking stroke into a locking position projected into said room wall means for maintaining said door in a closed condition in said door opening, a first locking bolt actuating means on said door accessible only internally of said room operatively effective to operate one said cooperating locking bolt, a second locking bolt actuating means on said door accessible only externally of said room operatively effective to operate the other said cooperating locking bolt, an electrical circuit and an electrically operated air conditioner operatively associated to provide air conditioning service for said room, and a circuit-breaking switch in said electrical circuit disposed in a strategic location at the terminal end in the path of said locking stroke of said second locking bolt so that incident to said stroke thereof said circuit-breaking switch is actuated to terminate operation of said air conditioner, whereby both said first and second locking bolts are available to be actuated for security purposes, said first locking bolt internally of said room and without effect on said air conditioner and said second locking bolt externally of said room and simultaneously causing the automatic termination of the operation of said air conditioner.

4,091,867

FLEXIBLE CONDUIT INJECTION SYSTEM

Frederick E. Shannon, Jr., Carrollton, and Tibor Laky, Dallas, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Jan. 14, 1977, Ser. No. 759,464

Int. Cl.[2] E21B *19/08*

U.S. Cl. 166—77 **9 Claims**

1. A system for injecting flexible conduit into a well against the pressure of the well, the system comprising:

connector means attached to the well and in communication with the well and aligned with the well for providing a passage aligned with the well through which a flexible conduit may be injected into the well;

injector drive means for engaging the flexible conduit, injecting it against the pressure of the well into the well, and retrieving it from the well;

said injection drive means imparting movement to the flexible conduit in a direction which is not aligned with the well;

seal means in fluid communication with said injector drive means for sealing with the flexible conduit to prevent well fluids from escaping from said injector drive means;

curved guide means in fluid communication with both of said connector means and said injector drive means for guiding the movement of the said flexible conduit, while the flexible conduit is subject to the pressure of the well, between said injector drive means and said connector means;

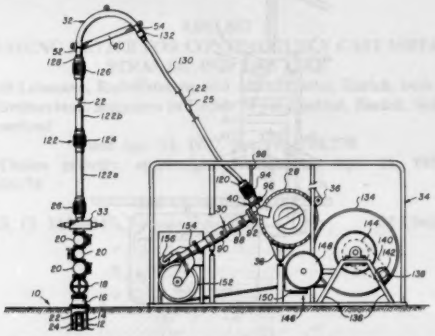
storage means for storing the flexible conduit which will be injected into the well;

fair lead guide means for guiding the movement of the flexible conduit between said storage means and said injection drive means;

measuring means for measuring the amount of flexible conduit that is injected into or retrieved from the well; and

common skid frame means for supporting each of said injector drive means, storage means, fair lead guide means, seal means, and measuring means independently from the well; and

wherein said curved guide means includes:



curved tubular housing means capable of withstanding the pressure of the well and having an internal, curved passage through which the flexible conduit may pass,

a plurality of roller means disposed within the curved passage of said curved housing means for guiding said flexible conduit through said curved passage with a minimal amount of frictional engagement, and

mounting means for mounting said roller means in a substantially precise hyperbolic curve in said curved passage,

said mounting means including a plurality of roller housing means for housing said roller means with each roller housing means housing two roller means, a plurality of link means with each of said link means linking together two of said roller housing means, and means for anchoring the ends of said mounting means to said curved housing.

4,091,868

METHOD OF TREATING OIL WELLS

Eugene C. Kozlowski, Anaheim, and Charles A. Stout, Tustin, both of Calif., assignors to Diversified Chemical Corporation, Stanton, Calif.

Filed Mar. 7, 1977, Ser. No. 775,332

Int. Cl.[2] E21B *33/138*

U.S. Cl. 166—250 **20 Claims**

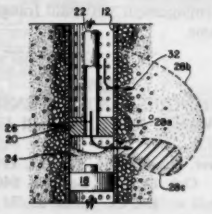
1. As a method for restoring to production oil wells in which production has been impaired by the rupture of a perforated liner and intrusion through the rupture of sand from the adjacent formation into the well, the steps comprising:

(a) isolating from the rest of the well the section of the liner which includes the rupture to permit selective pumping of liquid to the rupture zone of the well;

(b) determining the rate of flow at a predetermined pressure of water through the perforation to thereby predetermine a volume for a plug zone in the formation adjacent the rupture zone;

(c) pumping a plugging solution into the rupture zone at a predetermined rate for a predetermined time to result in said predetermined plug zone volume, said plugging solution containing precatalyzed resin which sets in a time period of from about one-half to about ten hours to a water impermeable gel which incorporates without substantial weapage the water in the plug zone and which is not adherent to silicate surfaces;

(d) pumping water into the rupture zone at a predetermined



rate for a predetermined time to force the plugging solution out of the well and into a plug zone of said predetermined volume in the sand formation adjacent the rupture zone to thereby form upon the setting of the resin a water impermeable plug to thereby permanently prevent intrusion of sand through the rupture into the well; and

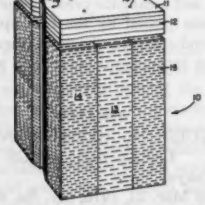
(e) holding by adjusting the pressure of the water the resin containing solution static in the plug zone for from about one-half to ten hours until the resin sets to form an impermeable plug.

4,091,869

IN SITU PROCESS FOR RECOVERY OF CARBONACEOUS MATERIALS FROM SUBTERRANEAN DEPOSITS

Wilmer A. Hoyer, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Sep. 7, 1976, Ser No. 720,914
Int. Cl.[2] E21B *43/24, 43/26*
U.S. Cl. 166—259 **7 Claims**



1. A method for recovering carbonaceous material from a subterranean deposit which comprises:

(a) rubblizing a first portion of the deposit;

(b) retorting the resulting rubblized first portion to recover carbonaceous material therefrom and thereby provide void space therein;

(c) providing a first multiplicity of vertical blasting holes in the deposit laterally adjacent to the first portion;

(d) providing a second multiplicity of vertical blasting holes in the deposit farther from said first portion than the first multiplicity of blasting holes, the first and second multiplicities of blasting holes substantially defining a second portion of the deposit contiguous to the first portion;

(e) loading each blasting hole with an explosive charge, the primary purpose of the explosive charges in the first multiplicity of blasting holes being to compact the retorted permeable first portion of the deposit and the primary purpose of the explosive charges in the second multiplicity of blasting holes being to rubblize the second portion of the deposit;

(f) detonating the explosive charges in the first multiplicity of blasting holes such that the first portion is laterally compacted to substantially reduce the void space therein, thereby reducing the first portion's permeability to fluid flow;

(g) detonating the explosive charges in the second multiplicity of blasting holes thereby laterally rubblizing the second portion of the deposit and further compacting the first portion; and

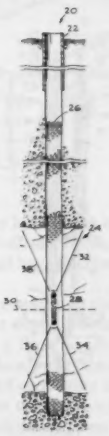
(h) retorting the second portion to recover carbonaceous material therefrom.

4,091,870

METHOD FOR GENERATING HORIZONTAL FRACTURES IN A WELLBORE

Charles S. Godfrey, and E. T. Moore, Jr., both of Berkeley, Calif., assignors to Physics International Company, San Leandro, Calif.

Filed Oct. 26, 1976, Ser. No. 735,676
Int. Cl.[2] E21B *43/26*
U.S. Cl. 166—299 **6 Claims**



3. A method of producing a planar fracture at a desired location in a rock formation without any appreciable crushing of the rock formation, the steps comprising:

positioning explosives of preselected dimensions in a plane perpendicular to the plane in which said fracture is to be formed with the center of said explosives aligned with said location, the dimensions and explosives being selected to produce a load velocity which is greater than the shear velocity; and

simultaneously igniting opposite ends of said explosives, to detonate said explosives, whereby the detonation results in the production of said planar fracture as a result of the interaction of shear waves, generated by the simultaneous ignition of the opposite ends of said explosives.

4,091,871

HORSESHOES MADE FROM TITANIUM ALLOY COMPOSITIONS

Mildred Chiaramonte, 305 E. 86th St., New York, N.Y. 10028, and Leonard E. Preiss, Sr., 503 Onderdonk Ave., Ridgewood, Queens, N.Y. 11237

Filed Jul. 22, 1975, Ser. No. 598,119
Int. Cl.[2] A01L *1/02*
U.S. Cl. 168—4 1 Claim

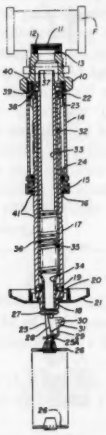
1. A horseshoe made from a titanium alloy composition wherein in addition to titanium as the base metal there is incorporated 6% by weight of aluminum and 4% by weight vanadium of the total alloy composition.

4,091,872

ADJUSTABLE DRY PENDENT SPRINKLER

George S. Mountford, Chippewa Lake, Ohio, assignor to A-T-O Inc., Willoughby, Ohio

Filed Feb. 7, 1977, Ser. No. 766,767
Int. Cl.[2] A62C *39/00*
U.S. Cl. 169—37 6 Claims



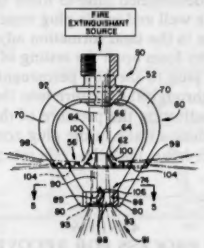
1. An adjustable dry pendent sprinkler comprising a telescopically engaged tubular fitting and a cylindrical barrel, means on one end of said cylindrical barrel for engagement in distributing piping, a frangible closure in said means, one end of said tubular fitting extending outwardly of the other end of the said cylindrical barrel, a normally closed sprinkler on said one end of said tubular fitting and a pair of telescopically engaged tubular members disposed within said tubular fitting, one of said tubular members being shorter than the other and slidably positioned within the other one, one end of said shorter tubular member being tapered exteriorly, and one end of the other tubular member being outwardly flared, said flared end being adjacent said tapered end, a plurality of spheres positioned between the flared and tapered ends of the tubular members arranged to normally prevent relative motion of said tubular members, springs engaging said tubular members normally urging them in opposite directions, said other longer one of said tubular members engaging said closed sprinkler and held stationary thereby whereby opening of said sprinkler upon reaching a predetermined temperature permits said springs to move the longer tubular member outwardly of said sprinkler and the flared and tapered end portions of the tubular members relative to one another to free said spheres for radial movement and permit said springs to move the shorter tubular member into engagement with said frangible closure so as to rupture the same.

4,091,873

FIRE EXTINGUISHANT DISPENSING NOZZLES

Clements M. Werner, 4246 S. Whitnall Ave., Milwaukee, Wis. 53207

Division of Ser. No. 769,425, Feb. 17, 1977. This application Oct. 11, 1977, Ser. No. 840,858
Int. Cl.[2] A62C *35/34*
U.S. Cl. 169—37 7 Claims



1. In a pendent sprinkler for producing a downwardly directed spray of fire extinguishant, the sprinkler comprising a downwardly opening nozzle for generating a stream of extinguishant, a deflector for diverting a portion of the stream outwardly and means for supporting the deflector in fixed, spaced-apart relation beneath the nozzle opening, the deflector including means beneath the nozzle defining an aperture for passing a portion of the stream, the improvement comprising means for providing a second aperture beneath the first-mentioned aperture, and means for creating turbulence in the portion of the stream passed by the first aperture as it passes through the second aperture, the turbulence generating means being disposed to project into the second aperture.

4,091,874

FIRE EXTINGUISHING METHOD AND SYSTEM FOR LARGE BUILDINGS

Kodo Monma, Tokyo, Japan

Filed Mar. 22, 1976, Ser. No. 669,081
Claims priority, application Japan, Jun. 16, 1975, 50/72046
Int. Cl.[2] A62C *1/02, 3/00, 35/00*
U.S. Cl. 169—46 10 Claims

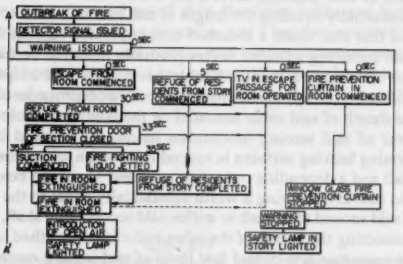
1. A mehtod for rapidly extinguishing fires in a building having a plurality of fire fighting sections therein each including closure means for isolating that section from the other sections comprising the steps of

actuating the closure means in a fire fighting section in which a fire has broken out after occupants have escaped from the fire fighting section;

evacuating flame, smoke and air from the fire fighting section from a position adjacent the floor of the fire fighting section; and

injecting a liquefied nitrogen fire extinguishing agent into the fire fighting section from a position adjacent the ceiling of the fire fighting section whereby the liquefied nitrogen fire extinguishing agent is evenly distributed through-

out the fire fighting section and over articles in the fire fighting section due to the draw created by the evacuation from a position adjacent the floor of the fire fighting



section causing the atmosphere within the fire fighting section to run short of oxygen while the temperature in the fire fighting section is promptly reduced below the flashing point of combustibles in the fire fighting section.

4,091,875

DEVICE FOR EXTINGUISHING A LIQUID-FUEL FIRE BY ISOLATION

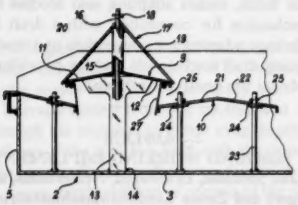
Jacques Colome, Manosque; Alain Duchene, Pierrevert, and Jean Regnier, Manosque, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jul. 22, 1976, Ser. No. 707,767

Claims priority, application France, Jul. 31, 1975, 75 23956; Jul. 5, 1976, 76 20522

Int. Cl.[2] A62C *7/00*

U.S. Cl. 169—49 **14 Claims**



1. A device for extinguishing a liquid-fuel fire by isolation comprising at least one bottom receptacle for collecting the liquid fuel and a top cover for closing the receptacle, said cover being provided with sloping channels for the flow of the liquid fuel and with openings through which said liquid fuel passes to the bottom of said receptacle wherein said openings are closed by retractable shutters which withdraw under the pressure of the liquid within the channels and close automatically after said liquid has flowed into said receptacle, said top cover being constituted by a plurality of adjacent plates which are slightly bent so that each plate forms a wide-angle dihedron, the interior of which is directed towards the bottom wall of the receptacle, said plates being arranged alternately at two levels which are relatively displaced in the direction at right angles to said bottom wall so that one of the openings for the flow of liquid fuel is delimited between the outer edges of two successive plates at each of these levels.

4,091,876

FIRE SPRINKLING SYSTEM FOR MOBILE TRAILERS

Robert P. P. Valdatta, 208 4th Ave., Seward, Ak. 99664

Filed Jul. 12, 1976, Ser. No. 704,682

Int. Cl.[2] A62C *35/12*

U.S. Cl. 169—62 **1 Claim**

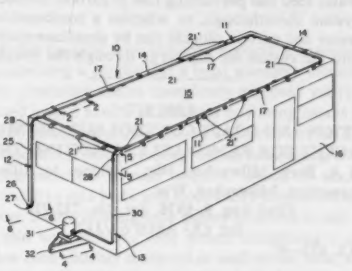
1. A fire sprinkling system for a mobile trailer having a roof and sidewalls extending downwardly from the perimeter edges of the roof, the system comprising, in combination:

a plurality of stand-off brackets each having one end mounted to the roof at a position spaced inwardly of the edge perimeters, with the brackets projecting upwardly from the roof and terminating in a ring-shaped holder a short distance above the roof, the brackets being disposed on the roof in spaced apart series relationship defining generally a configuration concentric with the roof perimeter edges and spaced slightly inwardly therefrom;

an endless sprinkler loop of cylindrically shaped tubing disposed above the roof and secured in position thereabove by passing through the ring-shaped holders on the stand-off brackets, the loop thus being concentric with the perimeter of the roof edges and passing completely thereabout;

a series of sprinkler heads disposed about the loop and facing inwardly from the loop generally parallel to the roof, the sprinkler heads spaced from the roof, each of the sprinkler heads being in fluid communication with the loop tubing and mounted thereon to receive therefrom any substance flowing through the tubing, each sprinkler head having a face surface spaced furthest from the tubing;

a series of L-shaped hollow couplers disposed about the loop in spaced relationship to each other, each coupler having one end in fluid communication with the tubing with the couplers extending outwardly from the tubing in a direction to project over the adjacentmost roof perimeter edge with their opposite end disposed generally parallel to the trailer sidewalls and opening downwardly from the roof;



a plurality of sprinkler heads, each head associated with one of the couplers and affixed thereto in fluid communication therewith, each head having a face surface spaced furthest from the coupler;

a plurality of nozzles mounted to the face surface of the first mentioned sprinkler heads in fluid communication therewith for directing a flow of any substance through the loop and sprinkler heads onto the roof, each of the nozzles being independent of each other and directed in a manner to completely cover the roof with their spray;

a plurality of nozzles mounted to each of the face surfaces of each of the second mentioned sprinkler heads in fluid communication therewith for directing a flow of any substance through the loop and couplers and sprinkler heads onto the surfaces of the sidewalls, each of the nozzles being independent of each other and directed in a manner to completely cover the sidewalls with their spray;

a tubular water feed line having one end connected to the sprinkler loop in fluid communication therewith, the water feed line running downwardly therefrom and terminating at is opposite end adjacentmost a lower portion of a sidewall forming the front of the trailer;

a water shut-off valve operable between an open and closed position connected to the terminal end of the water feed line for controlling the flow of water therethrough;

a hose bib connected to the free end of the water shut off

valve adapted to have a water hose connected thereto for supplying a source of water thereto;

a one-way check valve connected in the water feed line intermediate the shut-off valve and the sprinkler loop, the check valve permitting flow of water in the direction to feed the sprinkler loop while preventing any flow of any substance backward from the sprinkler loop into the water feed line;

a carbon dioxide feed line of a tubular configuration having one end in fluid communication with the sprinkler loop and with its opposite end extending downwardly from the loop along a sidewall of the trailer and terminating at a position adjacentmost a lower portion of a sidewall defining the front surface of the trailer;

a carbon dioxide reservoir tank containing a rechargable supply of pressurized carbon dioxide, the tank mounted on a sidewall of the trailer and connected in fluid communication with the free end of the carbon dioxide feed line;

a carbon dioxide shut-off control valve operable between an open and closed position, the valve disposed adjacent the tank in the feed line for controlling the flow of carbon dioxide from the tank into the feed line;

a one-way check valve connected in the carbon dioxide feed line intermediate the control valve and the sprinkler loop, the check valve restricting all flow through the feed line to be in the direction to feed the sprinkler loop while preventing any backflow of any substance from the sprinkler loop into the carbon dioxide feed line;

whereby water can be directed into the system with the check valve in the carbon dioxide feed line preventing loss of water from the system therethrough, or carbon dioxide can be directed into the system with the check valve in the water feed line preventing loss of carbon dioxide from the system therethrough, or wherein a combination of both water and carbon dioxide can be simultaneously directed into the system for discharge through the nozzles.

4,091,877

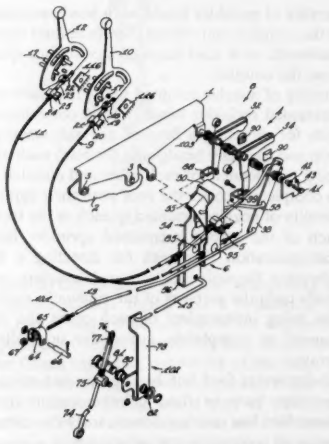
POSITION AND DRAFT CONTROL SUBASSEMBLY AND BRACKET FOR REMOVABLE MOUNTING THEREOF

David A. Berg, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Aug. 9, 1976, Ser. No. 712,718

Int. Cl.[2] A01B *63/112*

U.S. Cl. 172—9 **10 Claims**



1. A subassembly in a control mechanism for operating a hydraulic valve in hydraulic weight distribution system of a tractor comprising, a bracket having fastening means adapted for removably mounting said subassembly on a vehicle chassis, a first stub shaft and a second stub shaft mounted in parallel relationship on said bracket, a cantilever support supporting each of said stub shafts by one end on said bracket, a cable operated valve operating mechanism including adjacent levers pivotally mounted on said first stub shaft, a wide bearing on each of said adjacent levers, the total width of said bearings substantially equaling the length of said first stub shaft to stiffen said first stub shaft, a sheathed cable operated sensing mechanism including adjacent levers pivotally mounted on said second stub shaft, a sheathed cable having one end adapted for connection to a position control lever in a control console with the sheath of said cable mounted on the control console, a first lever of said sensing mechanism having a U-shaped bearing forming bearing surfaces in spaced relation on said second stub shaft and a depending operating arm, said U-shaped bearing of said first lever having a width substantially equal to the length of said second stub shaft to stiffen said second stub shaft, means connecting the sheath of the other end of said sheathed cable to the operating arm of said first lever of said sensing mechanism, means connecting the other end of said sheathed cable to a first lever of said valve operating mechanism, a second sheathed cable having one end adapting for connection to a draft control lever and the sheath of the cable mounted on said control console, a second lever of said sensing mechanism having a U-shaped bearing forming bearing surfaces in spaced relation intermediate the bearing surfaces of said first lever on said second stub shaft with a side of each of said U-shaped bearings mounted adjacent the cantilever support of the stub shaft to reduce the bending moment on said second stub shaft, a link pivotally mounted on said second lever and having an operating arm, means connecting the other end of the sheath of said second sheathed cable to said operating arm on the link of said second lever of said sensing mechanism, means connecting the other end of said second sheathed cable to a second lever in said valve operating mechanism, means adapting the first of said levers of said sensing mechanism for connection with a position control feedback linkage adapted for sensing position of a tractor hitch, means adapting said second lever of said sensing mechanism for connection with a draft load control feedback linkage adapted for connection to a draft load member for sensing draft load signals thereby providing a compact subassembly on the control mechanism.

4,091,878

GROUND WORKING IMPLEMENT

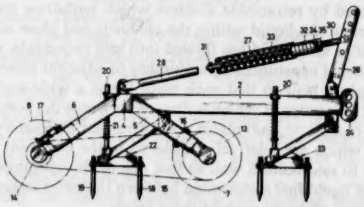
Cornelius Jan Steketee, Driewegen, Netherlands, assignor to P. J. Zweegers end Zonen Landbouwmachinefabriek B.V., Geldrop, Netherlands

Filed Jan. 30, 1976, Ser. No. 654,042

Claims priority, application Netherlands, Feb. 6, 1975, 7501408

Int. Cl.[2] A01B *49/02*

U.S. Cl. 172—147 **11 Claims**



1. A ground working implement comprising a rigid frame adapted to be connected to a three-point lifting device of a tractor vehicle, a pair of ground contacting rollers on said frame positioned successively in the direction of movement of the implement and each roller extending transversely to said direction, a plurality of axially extending ground contacting strips circumferentially positioned around each roller and extending the full length of each roller, means on said frame for

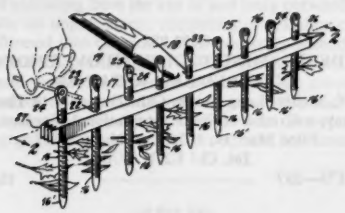
applying an adjustable force to press said rollers into ground contact, driving means coupling said rollers for transmitting rotary motion therebetween when said rollers are rotated by movement upon the ground, means on said rollers for rotating the forward roller with respect to the direction of movement at a lower circumferential speed than the other roller and both rollers rotating in the same direction, and a harrow mounted in front of at least one of said rollers, said harrow mounted parallel to and spaced from said one roller and comprising at least one row of spring-loaded vertical prongs extending over the length of said one roller.

4,091,879

CONVERTIBLE GARDEN RAKE AND CULTIVATING TOOL

Edward Lomberk, 1207 Sugar Mill Row, New Port Richey, Fla. 33553; Edgar C. Rosston, 583 W. 215th St., New York, N.Y. 10034

Filed Mar. 21, 1977, Ser. No. 779,345
Int. Cl.[2] A01B *1/14*
U.S. Cl. 172—373 2 Claims



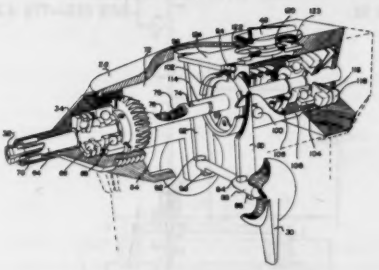
1. A convertible garden rake and cultivating tool comprising a crossbar being substantially the width of an ordinary garden rake, pull handle means extending rearwardly from the crossbar and tines laterally spaced from one another and vertically-adjustable through the crossbar to either even depth positions for the normal use of the tool as a rake with the upper ends of the tines passing upwardly through the top face of the crossbar or to an even lower depth position of certain of the tines while alternate tines may be raised above their ordinary raking positions to accommodate growing vegetable or flower rows and provide a cultivating tool that will, when used like a rake by a single pass along closely-spaced rows, cultivate the same on opposite sides of one or more rows at the same time, said tines being substantially longer than tines of an ordinary garden rake and threaded throughout substantially their entire length, said crossbar having free openings spaced from one another and corresponding in number to the number of tines of the tool when used as a rake, an internally-threaded elongated sleeve in each of the free openings and secured to the crossbar against rotation therein, said threaded tines being respectively threaded in the respective sleeves for vertical adjustment with respect to the crossbar and throughout substantially their full length between raking and cultivating positions, each sleeve being flanged and extended flush against the top face of the crossbar, said crossbar on its top face and about the sleeve flange having a scale of circumferentially-spaced radially-extending indicia lines, and each of said threaded tines having an enlarged head by which the threaded tine is manually adjusted in the sleeve and with respect to the crossbar, and said tine head having an indicator line thereon adapted to traverse the scale lines of the crossbar assembly so that the depth of adjustment or setting of the tine may be so readily determined therefrom.

4,091,880

SURGICAL WIRE INSERTER APPARATUS

Vernon H. Troutner, South St. Petersburg; Carl L. Foltz, Holiday, and Arthur F. Trott, Largo, all of Fla., assignors to Concept Inc., Clearwater, Fla.

Continuation-in-part of Ser. No. 623,391, Oct. 17, 1975, Pat. No. 4,050,528, which is a continuation-in-part of Ser. No. 610,869, Sep. 5, 1975. This application May 21, 1976, Ser. No. 688,574
Int. Cl.[2] A61B *17/16*
U.S. Cl. 173—163 11 Claims



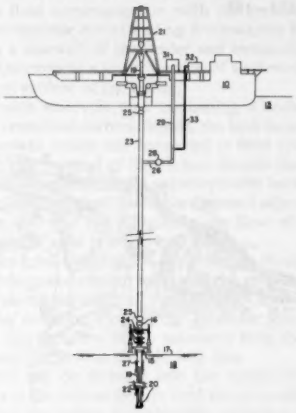
1. A portable surgical wire inserting apparatus comprising a housing comprising a handle and a head assembly mounted to said handle; powering means completely enclosed yet removably mounted in said handle so that said powering means is not exposed to contamination from the outside environment during a surgical operation, said powering means comprising a body, motor means mounted in said body, a source of electrical power mounted in said body and electrically connected to said motor means; a wire holding tube means mounted in said head assembly, said wire holding tube means comprising a coned tube, a draw tube slidably mounted in said coned tube, a split collet member adjustably mounted in said draw tube and adapted to engage said coned tube so that the split sections of the split collet member are forced together to hold a wire placed therein, and draw tube moving means adapted to move said draw tube within said coned tube, said draw tube moving means comprising a first cam means mounted to said housing, said first cam means comprising a turning member, a cam member mounted to said turning member and adapted to be rotated by the movement of said turning member, a drive bar mounted in said head assembly, said drive bar defining a plurality of pivot points and an aperture into which said cam member is positioned, said cam member being positioned adjacent an aperture defining wall of the drive bar, said cam member being provided with a plurality of camming sides adapted to engage the aperture defining wall and drive the drive bar to one of a plurality of predetermined positions, the number of predetermined positions being equal in number to the number of camming sides, at least one thrust bar having one end pivotally mounted adjacent one of said drive bar pivot points and adapted to be moved by said drive bar, a thrust means mounted to said draw tube and positioned adjacent each said thrust bar to drive said draw tube when said drive bar is cammed by said cam member; gear means connecting said motor means to said wire holding tube means for rotating said wire holding tube means; and external switch means moveably mounted on said housing, said external switch means being adapted to energize said motor causing said gear means to rotate.

4,091,881

ARTIFICIAL LIFT SYSTEM FOR MARINE DRILLING RISER

Leo Donald Maus, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Apr. 11, 1977, Ser. No. 786,530
Int. Cl.[2] E21B *15/02*
U.S. Cl. 175—7 **6 Claims**



1. In an apparatus for drilling a well through subterranean formations beneath a body of water from the surface of said body of water, said apparatus having a riser pipe which extends from the surface to a subsea wellhead and a drill string which passes through said riser pipe and into a borehole under the body of water, the improvement comprising:

a flow line in fluid communication with the upper portion of said riser pipe and extending up to the surface;

means for injecting gas into the lower end of said flow line at a rate sufficient to lift drilling fluid in said flow line to the surface;

means for detecting the pressure within said riser pipe and for transmitting a signal indicative of said pressure to the surface; and

valve control means responsive to the pressure signal from said sensing means which regulate the rate of flow of the drilling fluid from said riser pipe into said flow line such that the pressure of the drilling fluid in said borehole does not exceed the fracture pressure of said subterranean formations.

4,091,882

DRILLING TOOL

Fujio Hashimoto, 41-10, Minami Magome 1-chome, Ota-ku, Tokyo, Japan (143)

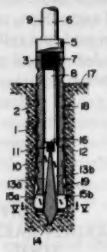
Filed Jan. 10, 1977, Ser. No. 758,151
Claims priority, application Japan, Jan. 14, 1976, 51-3610
Int. Cl.[2] E21B *9/26*
U.S. Cl. 175—286 **1 Claim**

1. A drilling tool which comprises:

a cylindrical structure having a spiral groove provided on the outer surface thereof and at least one elongated transversely extending through-hole provided in the lower portion thereof;

a tip which is loosely fitted into said through-hole in such a manner that a cutting edge of said tip faces outside, the number of said tips being equal to the number of said through-holes;

a tip guide bar having a head portion and a taper slit which is tapered downwardly starting from a part of the lower surface of said head portion so as to accommodate said tip therein, said part being in the vicinity of the axial line thereof, said tip guide bar being inserted into the lower end portion of said cylindrical structure in such a manner that said tip is pushed outwardly by said tip guide bar, said tip guide bar being engaged with the upper and inner portion of said tip so that said tip guide bar is slidably connected to said cylindrical structure;



a shank inserted into the upper end portion of said cylindrical structure and fixedly fastened thereto and adapted to be held and driven by a motor-driven drill; and

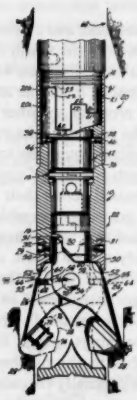
an elastic spring inserted between said tip guide bar and said shank.

4,091,883

UNDERREAMING TOOL WITH OVERRIDING EXTENDED ARM RETAINER

Robert W. Weber, Long Beach, Calif., assignor to The Servco Company, a division of Smith International, Gardena, Calif.

Filed Mar. 19, 1976, Ser. No. 668,577
Int. Cl.[2] E21B *9/30*
U.S. Cl. 175—287 **18 Claims**



1. An underreamer comprising:

a mounting member having a longitudinal axis;

a plurality of cutter arms;

means for pivotally mounting said cutter arms on said mounting member for lateral movement of the cutter arms between an inward position close to such axis and an outward underreaming position away from such axis; and

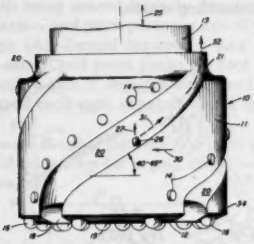
overridable means, separate from the means for pivotally mounting, operable for holding said cutter arms in said outward underreaming position, said overridable means being responsive to forces exceeding a predetermined level and applied in a lateral direction between the cutter arms to release and allow said cutter arms to move to said inward position.

4,091,884

ROTARY AIR PERCUSSION BIT

Robert D. Thomas, Tonkawa, Okla., assignor to Smith International, Inc., New Port Beach, Calif.

Filed Nov. 15, 1976, Ser. No. 741,560
Int. Cl.[2] E21C 13/00
U.S. Cl. 175—410 3 Claims



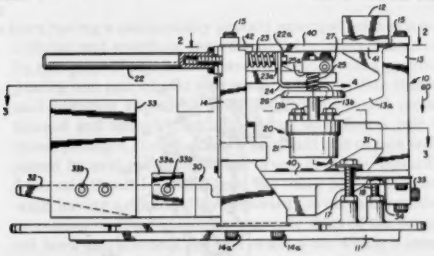
1. In a rotary percussion bit having a cylindrically shaped sidewall body portion with a face on one end and a shank attached axially to the remaining end, a plurality of inserts of wear resistant material mounted in said face and extending outwardly therefrom and a plurality of grooves formed in said face and extending from the axis of said body outwardly to said sidewalls, an improvement comprising a plurality of groove means formed into the sidewall of said body extending from the terminus of said face grooves and spiraling from said face end to said shank end, the angle of said spiraling groove means with respect to said face being less than 45°, said spiraling groove means causing dislodged chips to be conveyed up said spiraling groove by vibratory and rotational movement of said bit.

4,091,885

WEIGHT SENSING APPARATUS

Arthur R. Oxley, Wadsworth, Ohio, assignor to Advance Weight Systems, Inc., Medina, Ohio

Filed Aug. 30, 1976, Ser. No. 718,811
Int. Cl.[2] G01G 23/08, 3/14
U.S. Cl. 177—188 7 Claims



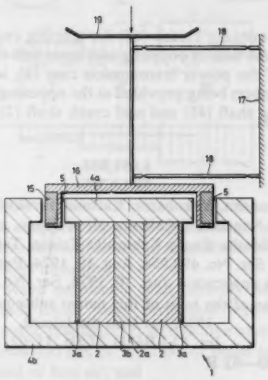
1. A weight sensing assembly comprising:
(A) a fixed vertically extending support;
(B) a movable vertically extending outrider;
(C) a plurality of horizontally disposed stabilizing flexure members
(1) interconnecting said support and said outrider, and
(2) forming a parallelogram therewith;
(D) an elongate lever having first and second ends;
(E) said first end of said lever being secured to said outrider for movement therewith;
(F) a counter balance secured to said second end of said lever
(G) a transducer interconnecting said fixed support with said lever intermediate said first and second ends and disposed in a plane parallel to the plane of said fixed support and adjacent the point of interconnection of said stabilizing flexures and said fixed support; and
(H) means connected to said transducer for measuring the movement of said outrider.

4,091,886

COMPENSATING FORCE-MEASURING OR WEIGHING DEVICE

Erich Knothe, Hasenwinkel; Christoph Berg, and Eberhard Stadler, both of Gottingen, all of Germany, assignors to Sartorius-Werke GmbH, Gottingen, Germany

Filed Jan. 26, 1977, Ser. No. 762,679
Claims priority, application Germany, Feb. 5, 1976, 2604437
Int. Cl.[2] G01G 3/14, 7/00
U.S. Cl. 177—210 EM 10 Claims



1. In an electromagnetic, compensating force-measuring or weighing device having at least one working coil movable in an air gap of a fixed magnet system, including a given active part, and means for compensating temperature influences in the magnet system, the improvement wherein said means for compensating comprise at least two members for temperature compensation, with predetermined weighting relative to their compensating effect on said given active part of said magnet system, said members being mounted separately from one another at at least two different points having different temperature influenced characteristics in the system for jointly producing a temperature compensating value which is optimally approximately equal to the exact average value of the actual temperature curve.

4,091,887

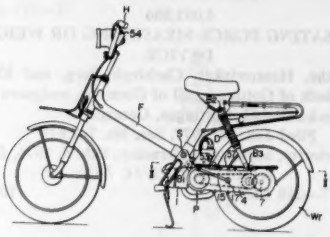
POWER UNIT FOR A MOTOR CYCLE

Noboru Kurata, Kamifukuoka, and Kuniyuki Yamamoto, Kodaira, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 15, 1976, Ser. No. 750,894
Claims priority, application Japan, Dec. 17, 1975, 50-149541
Int. Cl.[2] B62K 25/06
U.S. Cl. 180—33 A 8 Claims

1. A power unit for a motor-cycle of a type, in which a power transmission case (4) supporting at the rear end thereof a rear axle (7) is integrally joined together at one end of a crank case (3) of an engine 1, said power transmission case (4) being constituted by an inner half (4*a*) directly connected to said crank case (3) and an outer half (4*b*) separably connected to said inner half (4*a*); said rear axle (7) being fitted onto said inner half (4*a*) of the power transmission case (4), a driving power transmission mechanism (9) disposed in said inner half to connect said rear axle (7) and a crank shaft (2) of said engine (1); a pedal shaft (17) having an engine starting pedal (15) connected at one end thereof, and an engine starting shaft (41)

adjacent to said crank shaft (2) and axially aligned therewith fitted onto said outer half (4*b*) of the power transmission case (4), a starting power transmission mechanism (44) disposed in said outer half to connect said crank shaft (2) and said engine starting shaft (41); and a driving member and a driven member



of an over-running clutch (62) for starting engaged with one another at the time of coupling said inner and outer halves (4*a*) and (4*b*) of the power transmission case (4), said driving and driven members being provided at the opposing ends of each of said starting shaft (41) and said crank shaft (2).

4,091,888

TRUCKS

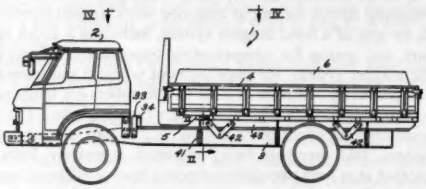
Akira Yamanaka, Yokohama; Katsumi Terakado, Yamato, and Naofumi Nagaike, Yokohama, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 498,854, Aug. 19, 1974, Pat. No. 3,981,530. This application Jun. 18, 1976, Ser. No. 697,638

The portion of the term of this patent subsequent to Sep. 21, 1993, has been disclaimed.

Int. Cl.[2] B62D *27/06, 33/02*

U.S. Cl. 180—82 R **4 Claims**



1. A truck comprising:

a body frame;

a loading table positioned on said frame;

energy absorber means operatively related to said frame and the table, said energy absorber means including a slot in one of said frame and said loading table, said slot extending substantially longitudinally of the truck; and

means for joining said table to the frame, said joining means including a member penetrating said slot and being dimensioned such that when a force exerted on said table is in excess of a predetermined value to cause movement of the table with respect to the frame, the kinetic energy of said movement is absorbed by the penetrating member expanding said slot.

4,091,889

CREEPER - DEADMAN

Vaikai K. Brown, Thompson, and Richard N. Fatur, Eastlake, both of Ohio, assignors to Towmotor Corporation, Mentor, Ohio

Filed Jan. 17, 1977, Ser. No. 760,064

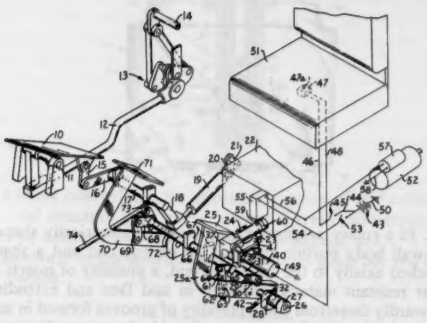
Int. Cl.[2] B60K *23/00*

U.S. Cl. 180—101 **14 Claims**

1. A control system for a vehicle having in combination an operator station including a seat, and a vehicle transmission control means for controlling the ratio of the transmission, manually operated override control means for selectively overriding the control of said transmission by said transmission control means, the improvement comprising:

disabling means movable between enabling and disabling positions;

a manually operable control member operably connected to said disabling means for selectively controlling the position of said disabling means;



connecting means for connecting said control member to said disabling means and for automatically disconnecting said control member from said disabling means; and

pressure responsive means responsive to a predetermined minimum pressure on said vehicle seat to connect said connecting means and responsive to the absence of said predetermined minimum pressure to disconnect said connecting means.

4,091,890

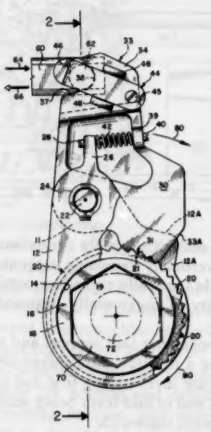
VERY HIGH TORQUE RATCHET WRENCH

Claude H. Wilmeth, and Fred H. Morton, both of Houston, Tex., assignors to N-S-W Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 619,116, Oct. 2, 1975, abandoned. This application Sep. 16, 1976, Ser. No. 723,861

Int. Cl.[2] B25B *29/00*

U.S. Cl. 81—57.39 **5 Claims**



1. A high-torque ratchet tool, comrpising:

(1) a pair of parallel-spaced-apart side plates;

(2) a ratchet wheel mounted on for rotation between said

plates, said wheel having a plurality of radially-extending driven teeth disposed about its outer periphery and defining a socket at the center thereof;

(3) a pawl member rotatably mounted about a pivot pin supported by and extending between said side plates, said pawl member having a pawl arm and a laterally-extending segment having a plurality of drive teeth matching and meshing with the driven teeth of said wheel, all of said drive teeth being spaced laterally from a line extending from the axis of said pivot pin to the axis of said wheel, and each angle (A), formed between a root line extending from the axis of said pivot pin to the root of each driven wheel tooth which is engaged by a pawl tooth and the front face of each such engaged wheel tooth, is greater than 90° ; and

(4) spring means coupled between said pawl arm and at least one of said side plates for urging said drive teeth toward said driven teeth.

4,091,891

HORN SPEAKER

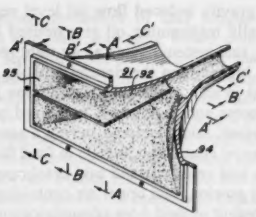
Masanori Hino, Hirakata; Taro Eguchi, Osaka, and Chitoshi Shiraga, Shimane, all of Japan, assignors to Onkyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 432,879, Jan. 14, 1974, Pat. No. 3,972,385. This application May 10, 1976, Ser. No. 684,927

Claims priority, application Japan, Jan. 17, 1973, 48-8056; Jan. 17, 1973, 48-8057; Mar. 10, 1973, 48-28438; Mar. 19, 1973, 48-31574

Int. Cl.² G10K *11/00*

U.S. Cl. 181—185 **2 Claims**



1. A horn speaker for wide angle sound distribution comprising:

a horn having a substantially straight principal horn axis and a throat and mouth in spaced parallel relation connected by two pairs of adjoined opposed side walls and a partition joining one pair of said side walls at the mid-line thereof said partition extending from the plane of said mouth toward and spaced from said throat to define a pair of sound passages, the inner surfaces of said pair of side walls joined by said partition being curved convexly inwardly from said throat to said mouth, the other pair of said side walls having a double convex inward curve, said partition increasing in cross section on opposite sides of the principal horn axis towards the side walls with which it intersects, said crossection being a maximum adjacent its side wall intersection substantially midway between said throat and said mouth, so that said sound passages increase in cross sectional area substantially uniformly from said throat to said mouth in planes normal to said principal axis, the inner surfaces of said walls and said partition being so shaped that the relationship for each sound passage is given by the equation:

$$l = -f + \sqrt{(lo + f)^2 + y^2}$$

wherein l is the effective length of a passage for propagating sound waves from the diaphragm to a point at a distance of y from the intersection of the principal horn axis with the mouth plane, the point being positioned on at least one first straight directional line contained in the mouth plane and passing through the intersection, lo is the length of the principal horn axis and f is a virtual focal distance: and

a diaphragm connected to said horn and positioned to launch sound waves into said throat towards said mouth.

4,091,892

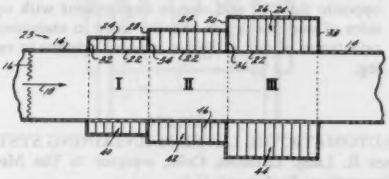
PHASED TREATMENT NOISE SUPPRESSOR FOR ACOUSTIC DUCT APPLICATIONS

Horst W. W. Hehmann, and Robert E. Kraft, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 502,141, Aug. 30, 1974, abandoned. This application Feb. 17, 1976, Ser. No. 658,700

Int. Cl.² F01N *1/00*; E04B *1/99*

U.S. Cl. 181—286 **6 Claims**



1. A sound wave suppressing panel for use in an exhaust duct having noise emanating within and in the direction of the duct fluid flow, the panel including:

a first sound wave permeable wall partially defining the duct, said first sound wave permeable wall having an effective acoustic resistance, at an effective sound pressure level of at least 160 dB, of less than or equal to 0.2 times the impedance of free air; and

a second sound wave impermeable wall spaced radially from the first wall defining a substantially annular gap therebetween, said second wall increasing step-wise in radial height in the axial direction of fluid flow and sound propagation so as to define axially adjacent gap sections having differing acoustic modal characteristics, and wherein the acoustic modal incompatibility between successive adjacent sections causes the preceding upstream section to present a pressure pattern to the succeeding downstream section which redistributes into higher order modes, said modes being substantially absorbed by said downstream sections.

4,091,893

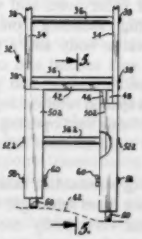
LADDER HAVING ADJUSTABLE LEG EXTENSIONS

Loyd L. Neal, 329 S. Wheeling, Kansas City, Mo. 64123

Filed Apr. 25, 1977, Ser. No. 790,245

Int. Cl.² E06C *7/44*

U.S. Cl. 182—204 **5 Claims**



1. A ladder comprising:

first and second legs spaced apart from one another in substantially parallel relation;

a plurality of rungs extending between said legs at spaced apart locations along their lengths;

means providing a slot adjacent the lower end of said first leg extending in a direction generally longitudinally thereof, said slot being open on opposite sides;

an extension member for said first leg having a body portion fitting in said slot and slidable therein between an extended position and a retracted position of the extension member, said extension member serving in the extended position as a downward continuation of said first leg to provide same with a greater effective length than said second leg;

releasable means for securing said extension member in its extended position; and

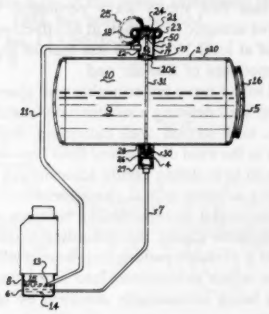
a pair of flanges on said body portion of the extension member, said flanges being spaced apart at locations adjacent opposite sides of said slot in engagement with opposite sides of said first leg to thereby assist in maintaining the orientation of said extension member relative to said first leg.

4,091,894

AUTOMATIC OIL LEVEL MAINTAINING SYSTEM

James R. Lang, Littleton, Colo., assignor to The Mechanex Corporation, Englewood, Colo.

Filed Jul. 28, 1976, Ser. No. 709,441
Int. Cl.² F01M *11/06*
U.S. Cl. 184—103 R **4 Claims**



1. In a system for regulating a liquid level in a sump, said system having a reservoir for containing liquid, said reservoir having an inlet for adding liquid to said reservoir, a valve port for enabling liquid to exit from said reservoir and an outlet member for receiving liquid from said valve port, the improvement comprising:

a rigid member having a first end adjacent said inlet and a second end within said outlet member and extending from said inlet to said outlet through said valve port;

a valve body within said outlet member for preventing liquid flow through said valve port, said valve body having a longitudinal opening extending from a first end to a second end of said valve body and a portion of said rigid member adjacent said second end of said rigid member disposed within said opening, said portion of said rigid member being in a spaced relationship to those portions of the valve body defining said opening for enabling angular movement of said rigid member separate from said valve body;

means for preventing substantial axial movement of said valve body separate from said rigid member;

means for urging said valve body into sealing engagement with said valve port for preventing liquid flow through said valve port; and

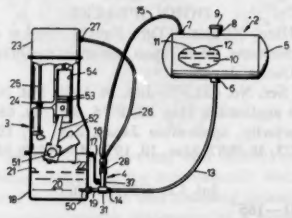
resilient seal means between said valve body and said rigid member for preventing fluid flow between said valve body and said rigid member and for enabling angular movement of said rigid member separate from said valve body for enabling lateral movement of said first end of said rigid member adjacent said inlet for facilitating adding liquid through said inlet and for preventing movement of said valve body out of sealing engagement with said valve port for preventing an undesirable flow of liquid from said reservoir.

4,091,895

OIL LEVEL SENSING APPARATUS

James R. Lang, Littleton, Colo., assignor to The Mechanex Corporation, Englewood, Colo.

Filed Mar. 9, 1977, Ser. No. 775,765
Int. Cl.² F01M *11/12*
U.S. Cl. 184—103 R **8 Claims**



6. In a gravity induced flow oil level regulator system for automatically maintaining oil at a desired level in an engine crankcase, said system having an air tight reservoir maintained at a level higher than the desired level at which oil is to be maintained in said crankcase, a standpipe located outside of said crankcase and maintained in a fixed position relative to said crankcase, said standpipe having a sensing chamber having a lower oil containing portion in fluid flow communication with each said reservoir and said crankcase and an upper air containing portion, said upper air containing portion having a sensing conduit in fluid flow communication with an air space in said reservoir and vent means for enabling air to enter and exit said air containing portion of said sensing chamber, the improvement comprising:

a liquid flow rate dampening means interposed between said oil containing portion of said sensing chamber and said crankcase and said reservoir whereby oil may flow from said reservoir to said crankcase without flowing through said liquid flow rate dampening means and said flow rate dampening means retards the rate of oil flow into and out of said sensing chamber.

4,091,896

CHAIN SAW BRAKING MECHANISM

Dieter Wieland, Neckarrems, and Volker Schurr, Waiblingen, both of Germany, assignors to Firma Andreas Stihl, Waiblingen, Germany

Filed Jan. 19, 1977, Ser. No. 760,674
Claims priority, application Germany, Jan. 22, 1976, 2602247
Int. Cl.² B60T *13/04*
U.S. Cl. 188—166 **17 Claims**

1. A braking mechanism for a hand-held, motor-driven chain saw which includes a guide bar for the chain, means connected to the shaft of the motor for driving the chain around the guide bar and a guide handle arranged on the saw generally transverse to the guide bar, said braking mechanism comprising:

a brake drum which rotates with the driving means for the chain;

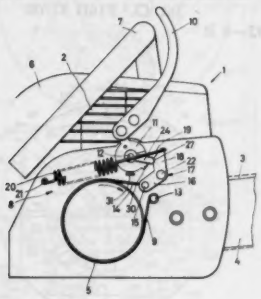
a braking member positioned to selectively contact said brake drum in order to stop the chain;

a lever pivotably mounted on the saw and extending to the vicinity of the guide handle;

means including an arm pivotably connected to the saw and connected to said braking member for selectively moving said braking member into contact with said brake drum upon rotation of said arm into a braking position;

a spring connected to the saw and to said arm for biasing said moving means toward the braking position and for applying the braking member to said drum with a force sufficient to brake said drum;

a tongue member pivotably attached to the saw and adapted to be moved in contacting relationship with said arm to force said arm at least out of the braking position and to hold said arm in a tensioned, non-braking position against the force of said spring; and



means for activating movement of said tongue member relative to said arm, said activating means comprising a cam member, separate from and acting on said tongue member, pivotably mounted on the saw coaxially with and coplanar with said tongue member, said cam member being responsive to rotation of said lever in a first direction for displacing said tongue member from its position holding said arm in tensioned position against the force of said spring to provide a quick release of said arm out of the tensioned position, whereby an immediate braking effect takes place, and being responsive to rotation of said lever in a second, opposite direction to move said tongue member in contacting relationship with said arm to force said arm out of the braking position and into the tensioned position.

4,091,897

HYDRAULIC COUNTERWEIGHT AND SHOCK-ABSORBING SYSTEM

John S. Andrepont, Lisle, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Jun. 24, 1977, Ser. No. 809,670
Int. Cl.[2] F16F *9/22*
U.S. Cl. 188—314 **3 Claims**

1. A hydraulic counterweight and shock absorbing system comprising:

a hollow cylinder having one closed end, the other end having an aperture adapted to receive a rod;

a reciprocable piston within and forming a liquid tight seal with the interior of said cylinder;

a rod having one end connected to said piston and passing through said other end of said cylinder in liquid-tight relationship with said aperture, the other end of said rod being adapted for connection to a load;

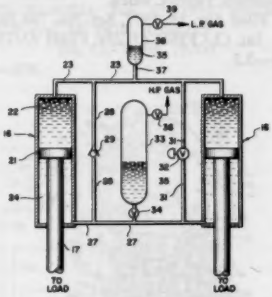
a first accumulator comprising a pressure vessel adapted to contain a lower liquid phase comprising a hydraulic liquid and an upper phase comprising a compressed gas;

first conduit means for flow of said hydraulic liquid between the lower end of said first accumulator and said apertured end of said cylinder;

valve means in said first conduit means for controlling the flow of liquid therethrough;

second conduit means for flow of said hydraulic fluid between said closed end and said apertured end of said cylinder;

check valve means in said second conduit means for permitting flow of hydraulic fluid therein from said closed end to said apertured end of said cylinder but restricting flow in the opposite direction;



third conduit means for flow of said hydraulic fluid between said closed end and said apertured end of said cylinder;

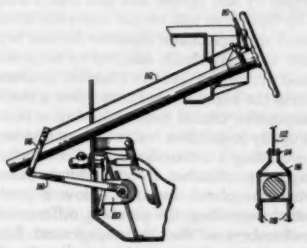
control valve means in said third conduit means for controlling the flow of liquid therein, said control valve means being operable to open and closed positions, and being further adapted to open when in the closed position when the pressure in the apertured end of said cylinder exceeds a predetermined value.

4,091,898

VEHICULAR AUXILIARY BRAKING SYSTEM

Jose A. Diaz, 3901 Kennedy Blvd., Union City, N.J. 07087

Filed Jan. 24, 1977, Ser. No. 761,951
Int. Cl.[2] B60K *29/02*
U.S. Cl. 192—3 M **2 Claims**



1. Vehicular auxiliary braking device adapted to conventional hydraulic foot braking system of a wheeled vehicle wherein said vehicle has a steering column and steering gear, associated hydraulic braking system, including master cylinder comprising:

A. a first hand lever mounted upon the steering column and in direct alignment with the steering wheel of the vehicle for reciprocable motion relative to the steering wheel;

B. a second lever, interconnected to the first lever and a pinion mounted upon a transmission whereby upon movement of the first lever, the second lever is rotated;

C. a torque transmission coactively connected to the pinion, said torque transmission having an eccentric means mounted thereon;

D. a third lever coactively positioned, relative to the eccentric of the torque transmission, said third lever being

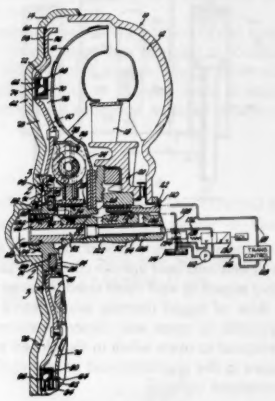
spring urged and adapted to engage and disengage a pushrod of the master cylinder, whereby gripping the first hand lever, braking force may be applied to the pushrod of the master cylinder.

4,091,899

LOCK-UP CONVERTER CLUTCH WITH CENTRIFUGAL CONTROL VALVES

Paul D. Stevenson, Ann Arbor, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 18, 1977, Ser. No. 788,243
Int. Cl.² F16D *43/284*; F16H *41/18*
U.S. Cl. 192—3.3 **2 Claims**



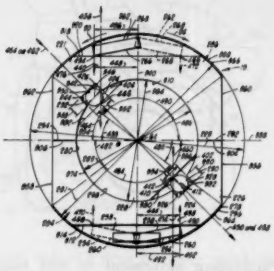
1. A torque converter and lock-up clutch for a vehicle drive comprising; an input member; an impeller secured to said input member, a turbine in fluid communication with said impeller and being disposed between said impeller and input member; a stator in fluid communication with said impeller and turbine and being disposed therebetween; a fluid operated clutch disposed between said turbine and said input member and being drivingly connected to said turbine; a clutch engagement chamber formed by said turbine and said clutch adapted to be pressurized by fluid from said torque converter to engage said clutch; a clutch disengagement chamber formed between said input member and said clutch adapted to be pressurized by fluid from said clutch engagement chamber to disengage said clutch; wherein the improvement comprises; a two stage centrifugally responsive clutch control having a first normally open centrifugally responsive valve means disposed on said clutch for providing a controlled fluid flow path from said clutch engagement chamber to said clutch disengagement chamber when the clutch speed is below a predetermined value, thereby controlling the pressure differential between said clutch chambers so that the engagement force of said clutch is controlled, and a second normally closed centrifugally responsive valve means disposed on said clutch for providing a controlled flow path from said clutch engagement chamber to said clutch disengagement chamber so that the engagement force of said clutch is controlled by the pressure differential of said clutch chambers when the clutch speed is equal to or greater than said predetermined value, said first valve means being operable to provide a pressure differential between said clutch chambers that will maintain the clutch disengaged over a predetermined clutch speed range below said predetermined value and provide a rapidly increasing pressure differential between said clutch chambers to control the clutch engagement force and clutch torque capacity at a level below the vehicle road load requirement when the clutch speed is between the highest speed of said predetermined range and said predetermined value, said second valve means being operable to provide a pressure differential between said clutch chambers that will maintain the clutch engagement force and clutch torque capacity substantially equal to the vehicle road load requirement when the clutch speed is at or above said predetermined value.

4,091,900

BRAKE DRIVE APPARATUS

Riza E. Murteza, Oklahoma City, Okla., assignor to LSB Industries, Inc., Oklahoma City, Okla.

Filed Apr. 28, 1975, Ser. No. 572,613
Int. Cl.² F16D *67/00*
U.S. Cl. 192—8 R **19 Claims**



19. A brake drive apparatus, comprising:

a housing having a brake surface formed in a portion thereof;

a brake shoe, having an opening providing an inner peripheral surface and a brake surface formed on a portion thereof, the brake shoe brake surface being disposed near the brake surface in the housing, the brake surface on the brake shoe being engageable with the housing brake surface in the braking mode;

a brake ring rotatable about a brake drive axis, having a portion engageable with the brake shoe at a position spaced a distance radially from the brake drive axis for rotatingly driving the brake shoe about the brake drive axis;

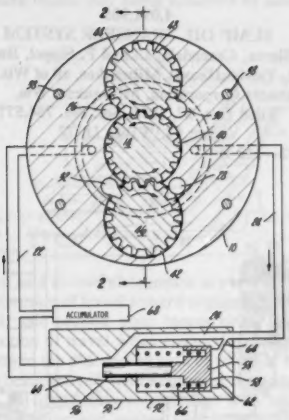
a driven cam disposed within a portion of the opening in the brake shoe; and

brake roller means disposed in the opening in the brake shoe having a portion engageable with the brake shoe and with the driven cam at a position spaced a distance radially from the brake drive axis, the brake shoe applying a force to the driven cam via the brake roller means for rotatingly driving the driven cam in a driving mode and the driven cam applying a force to the brake shoe via the brake roller means for positioning the brake shoe in the braking mode in response to a force applied to the driven cam, the radial distance between the brake drive axis and the position of engagement between the brake shoe and the brake ring being greater than the radial distance between the brake drive axis and the position of engagement between the brake roller means and the driven cam, a radial line extending through the brake drive axis and the position of engagement between the brake ring and the brake shoe being circumferentially spaced from a radial line extending through the drive axis and the position of engagement between the brake roller means and the driven cam, thereby producing a drag between the brake shoe and the housing when the brake ring rotatingly drives the brake shoe in the driving mode.

4,091,901
PUMP LOCK-UP POWER TRANSMISSION

Erwin F'Geppert, Novi, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 17, 1976, Ser. No. 742,713
Int. Cl.[2] F16D *31/04*
U.S. Cl. 192—61 1 Claim



1. A mechanical power transmission for interposition between drive and driven members: said transmission comprising a hydraulic pump that includes a live rotary gear (**14**) and a rotary gear housing (**10**); one of said gear and gear housing being connectable to the drive member, the other of said gear and gear housing being connectable to the driven member;

stationary wall means (**18**) defining an inlet chamber for delivering liquid to said gear at a first location on its periphery; stationary wall means (**20**) defining an outlet chamber for receiving liquid from said gear at a second location on its periphery; at least one idler gear (**46** or **48**) rotatably positioned within a circular cavity (**42** or **44**) in the gear housing in meshed engagement with said live gear, said circular cavity constituting a pumping passage communicating the inlet chamber with the outlet chamber;

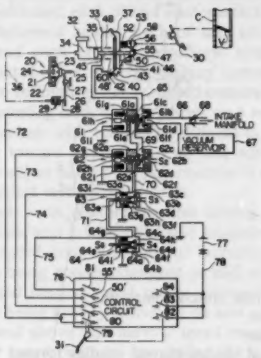
means external to the gear housing defining a liquid recirculation path from the liquid outlet chamber to the liquid inlet chamber; said recirculation path including a metering valve (**50**) having a liquid flow rate therethrough varying inversely according to the pressure existing in the outlet chamber;

said metering valve comprising a stationary valve housing (**52**) defining a tapered throat (**60**) of appreciable length; the larger end of said throat having a liquid connection (**24**) with the aforementioned outlet chamber, and the smaller end of said throat having a liquid connection (**22**) with the aforementioned inlet chamber; said stationary valve housing (**52**) further defining a control chamber (**62**) axially aligned with the tapered throat but separate therefrom, and a duct (**64**) connecting said control chamber with the first mentioned liquid connection (**24**); a movable piston (**54**) having a relatively large diameter control section (**58**) slidably positioned within the control chamber, and a relatively small diameter cylindrical flow-throttling section (**56**) extending into the tapered throat; and spring means (**66**) urging the piston outwardly from the tapered throat in opposition to the hydraulic force on said piston due to the control chamber pressure; said piston being arranged for movement from a fully open condition permitting unthrottled flow through the tapered throat to a fully closed position preventing flow through the throat; the taper on the throat being relatively shallow, whereby the piston has a long effective stroke when moving from its fully open condition to its fully closed condition.

4,091,902
CLUTCH CONTROL APPARATUS

Hideo Hamada, Yokosuka, Japan, assignor to Nissan Motor Company, Ltd., Japan

Filed May 11, 1976, Ser. No. 685,167
Claims priority, application Japan, May 12, 1975, 50-56451; May 19, 1975, 50-60024; Jun. 13, 1975, 50-72480; Jun. 24, 1975, 50-77673; Jun. 30, 1975, 50-80723
Int. Cl.[2] B60K *29/00*
U.S. Cl. 192—.076 9 Claims



1. An apparatus for controlling a clutch assembly of a driveline of an automotive vehicle having a manually operated power transmission system, said clutch assembly being operative between a fully coupled condition and a fully uncoupled condition through an allowance disengagement range in which the clutch assembly is initiated into motion to couple but stays uncoupled and a partial torque transmission range in which the clutch is partially coupled, comprising a clutch actuating mechanism including a control chamber contractable and expansible between a maximum-volume condition producing said fully coupled condition in the clutch assembly and a minimum-volume condition producing said fully uncoupled condition in the clutch assembly, an electrically operated valve arrangement including a vacuum port for providing communication between said control chamber and a source of vacuum and a plurality of air ports each for providing communication between said control chamber and the open air, said vacuum port being open to develop vacuum in the control chamber for causing the control chamber to contract toward said minimum-volume condition, said air ports having different cross sectional areas and being selectively opened to admit atmospheric air into said control chamber at different rates for causing the control chamber to expand at different rates and accordingly driving the clutch assembly at different velocities toward said fully coupled condition, and an electric control circuit including stationary switch means responsive to transition of the clutch assembly between said allowance disengagement range and said partial torque transmission range and throttle-valve position responsive means responsive to variation in the opening degree of the throttle valve of the mixture supply system of the vehicle engine, said control circuit being operative to cause said valve arrangement to close said vacuum port in response to predetermined conditions in which the clutch assembly is to be coupled, said control circuit being further operative to cause the air port with the largest sectional area to open and communicate with said control chamber when the clutch assembly is operating in said allowance disengagement range and to close in response to the transition of the clutch assembly from the allowance disengagement range to the partial torque transmission range and causing the remaining air ports to

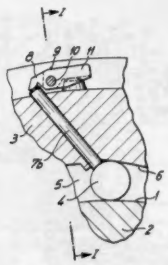
selectively open and communicate with said control chamber in response to variation in the throttle opening degree detected by said throttle responsive means when the clutch assembly is engaging.

4,091,903

ROLLER CLUTCH WITH CENTRIFUGAL ENGAGER

Dieter Seidel, Munich, Germany, assignor to Stieber Praezision GmbH, Munich, Germany

Claims priority, application Germany Aug. 7, 1975 2535320
Filed Aug. 3, 1976, Ser. No. 711,420
Int. Cl.[2] F16D *43/14*
U.S. Cl. 195—105 CF **8 Claims**



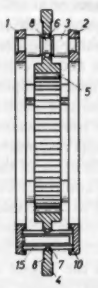
1. An over ride clutch comprising:
an inner race;
an outer race;
a plurality of wedge-shaped cradles formed between said inner and outer races;
a clutch roller disposed in each wedge-shaped cradle;
a centrifugal force-responsive rocker arm mounted on the outer periphery of said outer race; and
a pair of driver rods slidably disposed in non-radial positions in said outer race for engagement at their outer ends by said rocker arm, and for exerting a force against said clutch roller to move same into wedge condition in said wedge cradle, each driver rod of said pair being parallel with respect to each other and disposed in a plane parallel to the longitudinal axis of the over ride clutch.

4,091,904

SYNCHRONIZING DEVICE

Otto Beyer, Martinsried, Germany, assignor to Carl Hurth Maschinen- und Zahnradfabrik, Munich, Germany

Filed Aug. 2, 1976, Ser. No. 710,467
Claims priority, application Germany, Sep. 2, 1975 2538882
Int. Cl.[2] F16D *13/66*
U.S. Cl. 192—107 M **6 Claims**



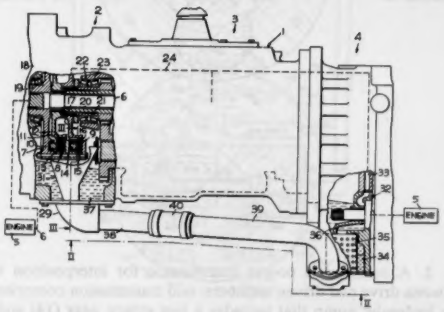
1. In a synchronizing device for a gear shift mechanism having at least one synchronizing friction cone coupling consisting of a cone ring having an external cone surface and a synchronous ring having a matching inner cone surface, at least one of said inner cone surface and said outer cone surface having a sprayed-on wear-resistant and frictionally favorable molybdenum layer thereon, the improvement comprising wherein a layer of manganese-alloyed carbon steel is sprayed onto the other of said inner cone surface and said outer cone surface, said other cone surface being unhardened.

4,091,905

SUMP OIL TRANSFER SYSTEM

Gerald E. Sieren, Greendale; LLoyd F. Sippel, Burlington, and George A. VandenHeuvel, Milwaukee, all of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 27, 1976, Ser. No. 754,577
Int. Cl.[2] F16D *13/72*
U.S. Cl. 192—113 B **10 Claims**



1. A hydraulic fluid transfer system in a vehicle transmission comprising, a transmission housing, a clutch carrier rotatably mounted in said transmission housing, a wet clutch including a hydraulic actuator and clutch discs mounted on said clutch carrier, hydraulic passage means continuously supplying hydraulic fluid to said wet clutch for wetting the clutch surfaces of said clutch discs, a sump formed in said transmission housing for receiving hydraulic fluid from said wet clutch, hydraulic pumping means continuously pressurizing hydraulic fluid and supplying hydraulic fluid to said hydraulic passage means, a fluid reservoir containing a fluid body for supplying hydraulic fluid to said hydraulic pumping means, a hydraulic conduit means connecting said sump to said reservoir, said sump and said transmission housing defining a cavity axially aligned with said wet clutch, and said sump containing a deflector having converging walls directing flow of hydraulic fluid thrown off of said wet clutch to an outlet formed by said sump means aligned with said deflector for inducing fluid flow from said sump through said conduit means to said reservoir, a hydraulic conduit means outlet immersed in the fluid body of said fluid reservoir, a hydraulic pumping means inlet including a filter centrally immersed in the fluid body of said reservoir reducing the fluid pressure in said reservoir and inducing fluid flow from said sump through said conduit means to said reservoir to maintain a fluid supply in said reservoir.

4,091,906

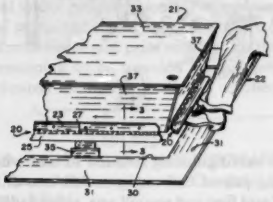
COLLAPSIBLE SAFETY GUARD FOR PLATFORM LIFT

David E. Clarke, Schaumburg, and Lawrence I. Richards, Elk Grove Village, both of Ill., assignors to Advance Lifts, Incorporated, Elk Grove Village, Ill.

Filed Feb. 28, 1977, Ser. No. 772,493
Int. Cl.[2] F16D *9/00*
U.S. Cl. 192—129 A **6 Claims**

1. A collapsible safety guard for use with electric controlled powered moving platform means having vertical lift and descent movements comprising in combination, first plate means of generally elongated length dimension to be mounted to said

platform means for movement therewith, second plate means of generally corresponding elongated length dimension to be pivotably attached to said first plate means, hinge means attaching said second plate means to said first plate means for pivotable movement therebetween, means for positioning said second plate means in a first selected angular depended position with respect to said first plate means, said positioning means being effective to arrest pivotable movement of said second plate means in a first rotational direction of travel about said first plate means and being effective to allow pivotable



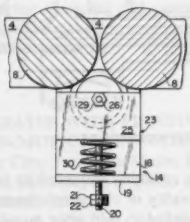
movement of said second plate means in a second and opposite rotational direction of travel toward engagement with said first plate means, said second plate means being moved in said second direction of travel when engaged by any encountered obstacle lying in the descending path of travel of said platform means, and being moved with continued engagement by said obstacle to be folded into engagement with said first plate means, and said first and second plate means when engaged comprising camming means to force said encountered obstacle from the path of travel of said platform means.

4,091,907

SPEED CONTROL ATTACHMENT FOR GRAVITY ROLLER CONVEYOR

Charles P. Tabler, Hamilton, Ohio, assignor to Kornylak Corporation, Hamilton, Ohio

Filed Jun. 3, 1977, Ser. No. 803,264
Int. Cl.[2] B65G *13/00*
U.S. Cl. 193—35 A **8 Claims**



1. A gravity undriven roller conveyor, comprising:

a stationary inclined rigid conveyor support having opposite outside side rails parallel to each other and the conveying direction, and each outside side rail being inclined downwardly in the conveying direction;

a plurality of substantially identical idler conveyor rolls having an elongated cylindrical shape extending substantially completely between said outside side rails, and said conveyor rolls being serially arranged in the conveying direction downwardly along said inclined conveyor support;

bearing means freely rotatably mounting each of said rolls at its opposite ends directly on respective ones of said outside side rails with all of said conveyor rolls having parallel axes of rotation in a common plane inclined downwardly in the conveying direction, and said axes being perpendicular to said conveying direction for supporting loads solely on the top surfaces of said conveyor rolls and conveying loads from the upper portion of said inclined conveyor support to the bottom of said inclined conveyor support solely by gravity;

a plurality of brackets spaced along said conveying direction, with each of said brackets being rigidly mounted on only one of said outside side rails and extending downwardly inwardly and toward the other of said outside side rails beneath the adjacent conveyor rolls;

a plurality of wheels separate from and independent of said bearing means, each having an elastomeric outside tire in direct engagement with the undersurface of two adjacent conveyor rolls, each of said elastomeric tires having an elastic limit of compression beyond which it will be permanently deformed and less than which it will be elastically deformed, each of said elastomeric tires being elastically deformed against each of said adjacent conveyor rolls, and each of said elastomeric tires further being constructed of a material having hysteresis properties when in rolling contact with said conveyor rolls;

means mounting each of said wheels on a respective one of said brackets with relative adjustment in the vertical direction toward and away from said adjacent conveyor rolls to adjust said elastic deformation of said elastomeric tires against said conveyor rolls;

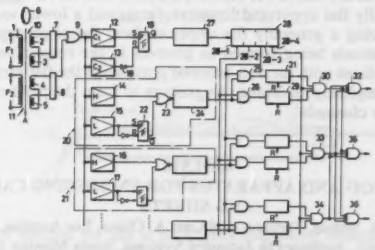
said wheels with elastomeric tires having high hysteresis properties, said brackets and said mounting means constituting speed control means for increasing the speed of articles being gravity conveyed on said conveyor rolls up to a fixed narrow speed range, decreasing the speed of articles being gravity conveyed on said conveyor rolls at any speed above said narrow speed range down to said narrow speed range by converting the kinetic energy of said articles above said narrow speed range to heat by the high hysteresis property of said elastomeric tires, and further decreasing the speed of articles being conveyed within said narrow speed range in correlation with an increase in the weight of said articles, all independently of the length of said conveyor.

4,091,908

COIN CHECKING DEVICE FOR A VENDING MACHINE

Yukichi Hayashi; Masayuki Tamura; Osamu Sugimoto, all of Sakado; Shinichi Kobayashi, Kamifukuoka, and Masanori Tanaka, Sakado, all of Japan, assignors to Nippon Coinco Co., Ltd., Tokyo, Japan

Filed Feb. 4, 1977, Ser. No. 765,565
Claims priority, application Japan, Feb. 10, 1976, 51-13719
Int. Cl.[2] G07F *3/02*
U.S. Cl. 194—100 A **4 Claims**



1. A coin checking device for a vending machine comprising:

a plurality of electronic type coin detectors each producing a detection waveshape of substantially crest shape in response to the passage of an inserted coin in the machine,

coin identifying means for producing a pulse having a pulse width substantially corresponding to the time duration or

width in the vicinity of the bottom of each detection waveshape produced from said coin detectors,

window means for judging the peak level of each detection waveshape in correspondence to the inserted coin of a predetermined denomination; and

output means for producing a true coin detection signal when the peak level of a true inserted coin is detected in said window means while said identifying means is producing said pulse produced from said checking means.

4,091,909

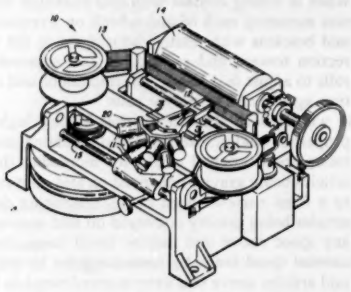
WIRE MATRIX PRINTER PRINTHEAD ASSEMBLY

Gene DuPree Lee, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 555,509, Mar. 5, 1975, abandoned. This application Sep. 7, 1976, Ser. No. 720,876

Int. Cl.[2] B41J *3/04*

U.S. Cl. 400—124 **8 Claims**



1. In a matrix printer mechanism having a printhead-carriage assembly and a print medium, the printhead comprising:

(a) a plurality of print members, each having an impression end and an activation end;

(b) a front bearing array through which the impression ends pass, disposed in confronting relation to the print medium;

(c) drive means operatively connected to the activation ends to selectively drive the impression ends into contact with the print medium; and

(d) a body assembly, terminating at one end in the front bearing array and mounting the drive means at the opposite end, having integral therewith a plurality of print member channels communicating with the front bearing array and the drive means, each channel containing one print member and each having a path consistent with the elastic curvature of the member contained therein, the body assembly comprising an upper section having a generally flat lower surface, a center section having generally flat upper and lower surfaces, and a lower section having a generally flat upper surface, the print member channels being formed as grooves in the respective flat surfaces with the non-grooved portions of the flat surfaces completely enclosing the grooves to form the print member channels.

4,091,910

METHOD AND APPARATUS FOR EMBOSSING CARDS AND SHEETS

Edgar A. Bolton, Tarzana, and Gust A. Olson, Los Angeles, both of Calif., assignors to Jacquard Systems, Santa Monica, Calif.

Continuation-in-part of Ser. No. 532,252, Dec. 12, 1974, abandoned. This application Dec. 15, 1975, Ser. No. 641,008

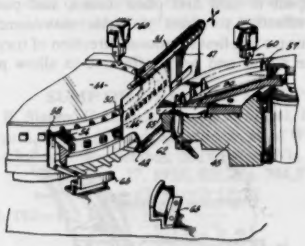
Int. Cl.[2] B41J *1/30*

U.S. Cl. 400—131 **92 Claims**

1. In a machine for embossing characters in flexible sheets, the combination comprising,

first and second embossing wheels mounted for coplanar synchronous rotation about constantly spaced adjacent parallel axes, with their peripheries spaced apart a distance greater than the thickness of said flexible sheets,

first and second corresponding sets of embossing molds respectively mounted about the peripheries of said first and second embossing wheels,



means for moving during rotation of said wheels a selected matching pair of embossing molds, one of said pair from each of said first and second sets, along radii of said wheels to extend radially outwardly from said embossing wheels,

whereby a character borne by the selected matching pair of embossing molds is embossed in a flexible sheet placed between the embossing wheels.

4,091,911

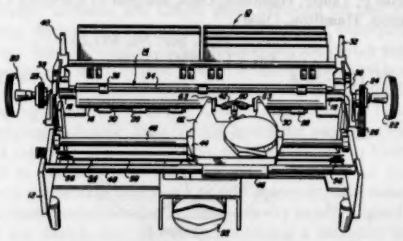
CONTROL APPARATUS FOR SERIAL PRINTER

Louis H. Chang; John C. Fravel, both of San Jose; Carl E. Herendeen, Danville, and Frank D. Ruble, Fremont, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed May 3, 1976, Ser. No. 682,877

Int. Cl.[2] B41J *1/30*

U.S. Cl. 400—70 **19 Claims**



1. A serial printer comprising:

a carriage;

a print member rotatably mounted to said carriage and including a plurality of character elements;

drive means coupled to said print member for rotating said print member to a desired rotational position in order to place a selected character element at a printing position adjacent a record medium to be printed upon;

servo control means coupled to said drive means and responsive to a set of input data and instructions for generating a control signal to control the direction and regulate the speed of rotation of said print member in order to bring said selected character element to a stop at said printing position; and

programmed data processing means coupled to said servo control means for supplying at least some of said set of input data and instructions under program control to said servo control means, said data processing means comprising a random-access-memory having a first addressable storage location for storing a first position signal indicative of the actual rotational position of said print member relative to a reference location and a second addressable

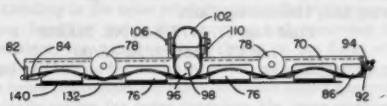
storage location for storing a second position signal indicative of said desired rotational position of said print member, said first and second storage locations capable of being addressed under program control to provide said first and second position signals at the output of said random-access-memory, said data processing means further comprising an arithmetic logic unit responsive to said first and second position signals for calculating the clockwise rotational difference between said first and second position signals under program control, and means responsive to said calculated difference for supplying a command signal under program control to said servo control means, said command signal being indicative of a desired velocity of rotation of said print member for the particular distance remaining to be traveled by said print member until said desired rotational position is reached.

4,091,912

RECORD MEDIA CLAMPING MECHANISM

James R. Moss, Lum, Mich., assignor to Computer Peripherals, Inc., Rochester, Mich.

Filed Mar. 17, 1977, Ser. No. 778,766
Int. Cl.² B41J *15/00*
U.S. Cl. 400—146 R **17 Claims**



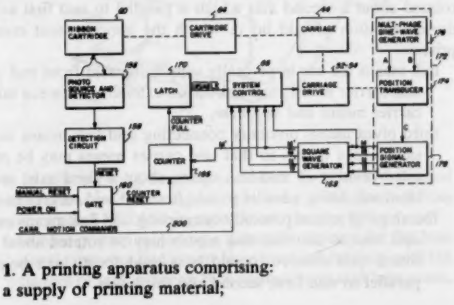
1. Apparatus for holding record media in precise position while performing recording operations thereon comprising a plurality of clamping members spaced from each other and aligned across the width of said record media adjacent at least one side of said record media and in contact therewith, a plurality of bearing elements intermediate said clamping members, a tension control member, a flexible member in tension trained in a path around said tension control member and engaged with said bearing elements and against said clamping members and secured at the ends thereof, and a solenoid energizable to move said tension control member for tightening said flexible member on said bearing elements and against said clamping members thereby increasing the force of said clamping members against said record media.

4,091,913

PRINTING APPARATUS WITH PRINTING MATERIAL NON-MOTION DETECTOR

Joseph P. Ku, Foster City; Fereidoon Matin, Pleasant Hill, and Richard D. Trezise, San Jose, all of Calif., assignors to Xerox Corporation, Stamford, Coan.

Filed Dec. 6, 1976, Ser. No. 747,768
Int. Cl.² B41J *33/14*
U.S. Cl. 400—124 **15 Claims**



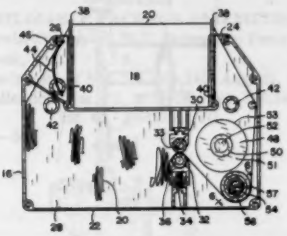
1. A printing apparatus comprising:
a supply of printing material;
a carriage assembly to which said supply of printing material is mounted;
a carriage drive assembly coupled to said carriage assembly for reciprocally moving same along a predetermined path past a printing station;
drive means mounted to said carriage assembly and operatively coupled to said supply of printing material for advancing said printing material in one direction only in response to and in synchronization with the movement of said carriage assembly in either direction along said predetermined path; and
means for detecting when said printing material fails to be advanced by at least a first predetermined amount when said drive means has been enabled to advance said printing material by at least a second predetermined amount.

4,091,914

WEAR-ACTIVATED RIBBON REINKER

Andrew D. Stipanuk, Kenosha, Wis., assignor to Porelon, Inc., Cookeville, Tenn.

Filed Feb. 22, 1977, Ser. No. 770,494
Int. Cl.² B41J *31/14*
U.S. Cl. 400—196.1 **35 Claims**



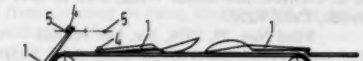
1. A device for replenishing marking fluid to a ribbon comprising:
a source of marking fluid adjacent said ribbon; and
wear-actuated means to cause contact of said marking fluid and said ribbon.

4,091,915

MACHINE FOR PACKAGING DISPENSING SPOONS AND METHOD

Antonius Bernardus Claasen, Sperwerlaan 4, Leende, Netherlands

Filed Aug. 16, 1976, Ser. No. 714,493
Claims priority, application Netherlands, Aug. 18, 1975, 7509802
Int. Cl.² B65G *47/24*
U.S. Cl. 198—389 **7 Claims**



1. A method for use in packaging dispensing spoons which comprises the steps of:
(a) successively moving spoons on a conveyor, the spoons each having a shank portion joining a spoon bowl at one end and at the opposite end having a protuberance disposed in the direction of the hollow side of the spoon bowl and substantially normal to the shank, said spoons being aligned on said conveyor in a longitudinal direction substantially in the direction of travel;
(b) passing said aligned spoons under a wire-like transport

means disposed near the horizontal termination location of the conveyor;

(c) hooking the protuberances of certain spoons which are properly positioned in an upward direction on the conveyor with the wire-like transport means while tilting the spoons upwardly as the spoons exit from the conveyor; and

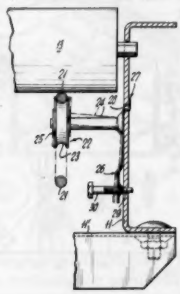
(d) transporting spoons hooked by means of the protuberances on the wire-like transport means to a discharge outlet, said spoons being transferred from the wire-like transport means to the discharge outlet while in a uniformly aligned direction.

4,091,916

APPARATUS FOR DRIVING INDIVIDUAL ROLLERS OF A POWER CONVEYER

Kent F. Warner, White Plains, N.Y., assignor to W & H Conveyor Systems, Inc., Carlstadt, N.J.

Filed Oct. 8, 1976, Ser. No. 730,985
Int. Cl.[2] B65G *13/02*
U.S. Cl. 198—790 **6 Claims**



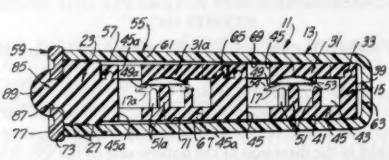
1. In a powered conveyor having a plurality of rollers carried by a frame and an endless driven belt disposed beneath the rollers, means for urging one section of said belt against at least certain of said rollers, said means each comprising a bracket pivotally attached to said frame and having means for modifying the tilt of the bracket relative to the frame, and a pressure roller carried by said bracket and engaging said belt on the side opposite said conveyor roller, said tilt modifying means adjusting the pressure at which said belt is urged against the associated conveyor roller, said pivotal attachment including ar. L-shaped offset portion on said bracket and said frame includes an elongated slot receiving said offset portion and pivotally retaining said bracket in position when said bracket is in close proximity to said frame.

4,091,917

CONTACT LENS CASE

Burrell E. Clawson, and James Weigl, both of 2241 Chicago, Riverside, Calif. 92507

Filed Nov. 29, 1976, Ser. No. 745,623
Int. Cl.[2] A45C *11/04*; B65D *85/54*; B08B *3/04*; B65D *41/00*
U.S. Cl. 206—5.1 **21 Claims**



1. A contact lens case for at least one contact lens comprising:

a container including a container body, a cover and means for releasably attaching said cover and container body together, said container having an interior for containing the contact lens and exposing the contact lens to a liquid solution;

a surface tension surface on said cover, said surface tension surface being within the interior of the container when said releasable attaching means releasably joins said cover and said container body together, said surface tension surface being adapted to releasably retain the contact lens on the surface tension surface by surface tension;

means on said container for holding the contact lens closely adjacent the surface tension surface; and

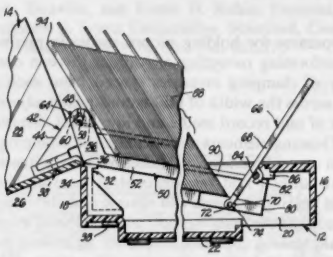
said releasable attaching means being releasable to permit said cover and said container body to be at least partially separated from each other whereby the contact lens can be releasably retained by surface tension on the surface tension surface and removed from the interior of the container to facilitate removal of the contact lens from the surface tension surface.

4,091,918

CONTAINER-CARD FILE STRUCTURE

George Soulakis, Hormosa Beach, and Charles G. Mandala, Rancho Palos Verdes, both of Calif., assignors to Eldon Industries, Inc., Hawthorne, Calif.

Filed Jan. 31, 1977, Ser. No. 763,802
Int. Cl.[2] B65D *5/50, 85/00*
U.S. Cl. 206—45.13 **14 Claims**



1. A container which includes a hollow base having an open top and spaced front and rear ends, a lid fitting over and enclosing said top of said base, said lid having front and rear ends, a first pivot means pivotally connecting said rear end of said base with said rear end of said lid so that said lid can be rotated about a first axis between a closed position covering said top of said base and an open position in which said lid extends generally in back of said rear end of said base, carrier means having front and rear ends, for supporting a load, said carrier means being located generally within the interior of said base when said lid is in said closed position, second pivot means pivotally connecting said rear end of said carrier means to said lid adjacent to said rear end of said lid so that said carrier means is rotated about a second axis which is parallel to said first axis during rotation of said lid in which the improvement comprises:

link means for use in pivotally supporting said front end of said carrier means, said link means extending between said carrier means and said base,

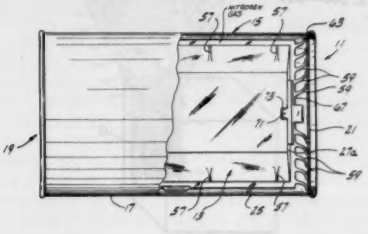
third pivot means pivotally connecting said link means and said carrier means so that said carrier means may be rotated relative to said link means about a third axis, said third axis being parallel to said first and said second axes,

fourth pivot means pivotally connecting said link means and said base so that said link means may be rotated about a fourth axis relative to said base, said fourth axis being parallel to said first, second and third axes.

4,091,919
WAFER PACKAGING SYSTEM

George M. MacLeod, Los Altos, and James F. Riley, Saratoga, both of Calif., assignors to Monsanto, St. Louis, Mo.

Filed Sep. 7, 1976, Ser. No. 721,013
Int. Cl.[2] B65D *81/24, 25/12*
U.S. Cl. 206—213.1 2 Claims

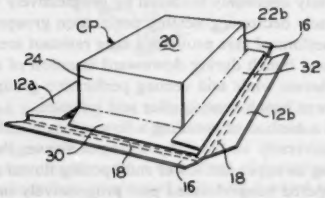


1. In a wafer packaging system for clean packaging and damage-free transporting of semiconductor wafers, said system including a tubular outer container and a tubular inner container adapted to be contained by the outer container in sealed relationship, the longitudinal axes of the inner and outer containers extending in the same axial direction, the improvement comprising handling means for inserting and removing the inner container, the outer container being in the form of a cylindrical can having hermetically sealed ends, at least one of said ends being removable, the inner container fitting generally concentrically within the outer container, the inner container having side walls resiliently spaced from the interior of corresponding side walls of the outer container through fin shock-absorbing means and end walls resiliently spaced from the corresponding ends of the outer container through fin shock-absorbing means, said fin shock-absorbing means aligned with the longitudinal axes providing slide means for loading and unloading the inner container, the outer container and inner container both being filled by a fluid environment sealed within the outer container, said fluid environment being non-contaminating and chemically nonreactive to said wafers, whereby, said wafers are maintained in a clean environment preventing long-term change in the characteristics of said wafers, and shocks applied to the outer container are prevented from damaging said wafers.

4,091,920
FLANGED CONTAINER

Harry E. Young, Maywood, Ill., assignor to Container Corporation of America, Chicago, Ill.

Filed Apr. 4, 1977, Ser. No. 784,240
Int. Cl.[2] B65D *85/30*
U.S. Cl. 206—320 1 Claim



1. In a form fitting shipping container, for a hollow flanged article such as a sink having a height and a width, formed from a unitary blank of foldable paperboard, the combination of:

(a) a base portion including a generally rectangular flat base panel receiving said article in an inverted position with the flanges of said article in face contact with said base panel, and with the body portion of said article extending upwardly from said flanges;

(b) an integral, hollow, cover portion disposed on said base panel over said article and including:

(i) a top panel having opposed pairs of side and end panels depending from opposed side and end edges of said top panel, said pairs of panels being of sufficient length to space said top panel from said base at least the height of said article;

(ii) certain of said side and end panels having foldably joined to their respective lower edges inner side and end flange panels extending normal thereto and overlying certain flanges of said article and being of sufficient length to span the distance from said article to an edge of said container so as to prevent the edges of said article from contacting the edges of said container said length being greater than the width of said article:

(c) said base portion also including opposed pairs of outer side and end flange panels of approximately the same length as said inner flange panels of said cover portion and being foldably joined to opposed side and end edges of said base panel and folded inwardly to overlie and be secured to said cover portion inner flange panels.

4,091,921
STERILIZABLE PACKAGE AND METHOD

Robert P. Lewis, Oceanport, N.J., assignor to Faser Industries, Saddle Brook, N.J.

Continuation-in-part of Ser. No. 606,510, Aug. 21, 1975. This application Mar. 22, 1977, Ser. No. 780,141
Int. Cl.[2] B65D *83/10*
U.S. Cl. 206—363 6 Claims

1. A sterilizable package comprising a plastic member, a paper member, a first heat seal marginally sealing the plastic member to the paper member to define a pouch receptive of an item to be sterilized, indicia borne by the paper member on the inside of the pouch located adjacent to and spaced from said marginal heat seal, said indicia changing color upon sterilization of the package, and at least one second heat seal located interiorly of the marginal heat seal and adjacent to and spaced from the indicia and cooperating with said marginal heat seal to surround and isolate the indicia to prevent the package contents from covering or being contaminated by coming in contact with said indicia.

4,091,922
CATHETER PACKAGE

Vernon C. Egler, Palatine, Ill., assignor to The Kendall Company, Boston, Mass.

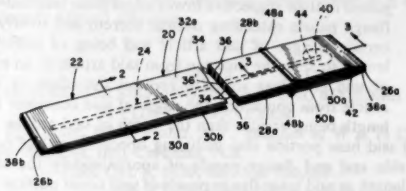
Continuation-in-part of Ser. No. 578,227, May 16, 1975, abandoned. This application Oct. 22, 1976, Ser. No. 734,859
Int. Cl.[2] B65D *83/04*
U.S. Cl. 206—364 29 Claims

26. A package, comprising:

an elongated catheter;

an elongated extruded container of a material resistant to the passage of bacteria, said container having a longitudinally extending cell of sufficient length to receive the catheter

intermediate ends of said container, said cell being slightly larger in cross-section than the catheter and containing the catheter, said container being sufficiently rigid throughout a substantial length of the container to prevent excessive flexation of the container and catheter, and said container comprising a pair of opposed outer walls defining a part of said cell and an opening extending through both the outer walls and cell and positioned adjacent to and spaced from



one end of the container, with said opening communicating between the outside of the container and said cell at a location adjacent one end of the catheter, and with said opening itself defining a region of sufficient weakness in said container to permit flexation of an end portion of the container about the weakened region and permit grasping of said one catheter end for removal of the catheter from the package for use; and means for releasably closing said opening to prevent contamination of the catheter.

4,091,923

COMBINED CARTON AND SUPPORTING PALLET

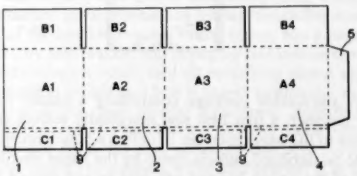
Michael Alfred Collins, Coventry, England, assignor to Covpak International Limited, England

Filed Mar. 22, 1976, Ser. No. 669,258

Claims priority, application United Kingdom, Jul. 31, 1975, 32148/75

Int. Cl.[2] B65D *19/06*

U.S. Cl. 206—386 **10 Claims**



1. A combined carton and supporting pallet therefor in which the carton is formed from thick, stiff cardboard, and has four walls, which, in use, are upright and flaps at the upper and lower edges of each said wall, said flaps being foldable inwardly on erection of said carton to form respectively the top and bottom surfaces thereof, and the pallet comprises a base and a one-piece inflexible floor hinged to the base along only one edge thereof, whereby the floor is hinged to lie flat on top of the base, the edges of said base and said floor, other than the hinged edges, being coextensive and free edges, the base and the floor being formed from thick, stiff inflexible cardboard, and each having the same plan-form and area as said carton, when erected, the carton and the pallet being retained together, in use, by so folding said flaps on the lower edges of the walls of said carton that, referring to the carton when upright, one pair of said flaps on one pair of opposite walls of said carton are positioned above the floor and the other pair of said flaps on the other pair of opposite walls are folded underneath the floor and are held between the floor and the base of the pallet by the weight of said carton, and, when the carton has been packed, also by its contents.

4,091,924

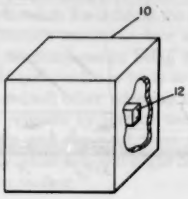
THERMALLY RESISTANT MAGNETIC TAPE ENCLOSED IN PROTECTIVE CONTAINER

Gerald S. Newton, Graham, Tex., assignor to Graham Magnetics Incorporated, Graham, Tex.

Division of Ser. No. 416,884, Nov. 19, 1973. This application Jan. 2, 1976, Ser. No. 645,945

Int. Cl.[2] B65D *85/67, 85/671;* **G11B** *5/72, 23/02*

U.S. Cl. 206—389 **4 Claims**



1. In a magnetic recording apparatus of the type wherein a reeled magnetic tape is enclosed in a sealed, protective container, the improvement wherein said tape is a magnetic tape comprising a substrate formed of a synthetic organic resin, a first magnetic pigment containing coating on one side of said substrate and a second non-magnetic conductive pigment containing coating on the other side of said substrate wherein one of said coatings has a polyester polyurethane resin matrix and the other of said coatings has a polyether polyurethane resin matrix.

4,091,925

SNAG RESISTANT VENTED FLOWER SLEEVE

Gregory Griffo, San Dimas, and Raymond H. Sanders, Alta Loma, both of Calif., assignors to Standun, Inc., Compton, Calif.

Filed Aug. 15, 1977, Ser. No. 824,643

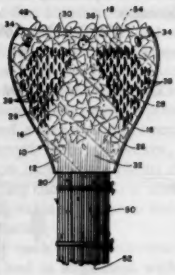
Int. Cl.[2] A01G *5/00;* **A47G** *7/02;* **B65B** *1/04;* **B65D** *65/04, 75/02, 85/52*

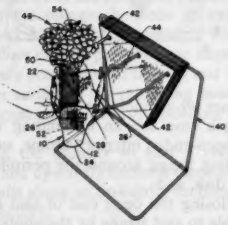
U.S. Cl. 206—423 **25 Claims**

1. In a flower sleeve adapted for transversely enclosing a flower bunch and the like; the combination of: front and back flexible panels connected at side edges thereof and unconnected at upper and lower edges thereof; a generally transversely centralized and progressively downward transversely increasing nonperforated area in at least one of said panels transversely oppositely bordered by progressively downward transversely decreasing venting perforation groups; whereby, said unperforated area provides a snag resistant area for stems of a flower bunch during downward insertion of said flower bunch therein while said venting perforation groups still provide flower bunch venting after said insertion.

18. In a method of installing a flower bunch and the like in and transversely enclosed by a flower sleeve; the steps of: providing an upper and lower end opening flower sleeve having a tapered nonperforated part progressively increasing in transverse width in downward extension and transversely oppositely bordered by oppositely tapering venting perforated parts; suspending said sleeve with sleeve ends generally open; inserting stem and portions of a flower bunch downwardly through said sleeve upper end and downwardly through said sleeve end from said sleeve lower end while maintaining said stem end portions generally aligned with said sleeve progres-

sively increasing nonperforated part and generally bordered by said oppositely tapered venting perforated parts; during said





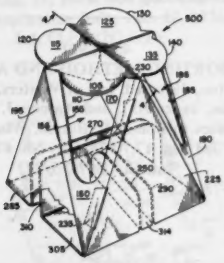
stem end portion inserting, locating a remainder of said flower bunch generally in and transversely enclosed by said sleeve.

4,091,926

CONTAINER FOR HOLDING FOUR GLASSES IN SPACED RELATION AND BLANK FOR FORMING SAME

Harold Cravens, Woodridge, Ill., assignor to H. Fishlove & Co., Chicago, Ill.

Filed May 19, 1977, Ser. No. 798,499
Int. Cl.[2] B65D *85/44*
U.S. Cl. 206—426 **28 Claims**



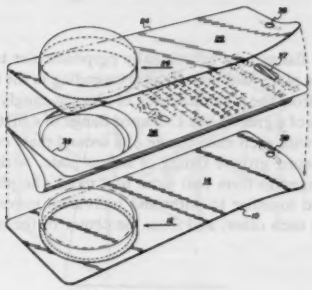
1. A blank for folding into a container holding four glasses, said blank comprising a one-piece construction having fold lines and edges defining: (a) a first set of four triangularly shaped display members; (b) a second set of four triangularly shaped side members interleaved with said first set such that the apexes of each set extend toward the bases of the other set with the bases of said second set not being co-linear; (c) a third set of four generally triangularly shaped top forming members each having at least a portion of the base thereof defined by a fold line common to a portion of the base of a respective one of the first set of triangularly shaped display members with both of the outermost members of the third set having a divider extending from the outermost edge thereof; (d) a fourth set of only three triangularly shaped divider members interleaved with the third set such that the apexes of each set extend toward the bases of the other set, (e) rectangular bottom forming members extending outwardly from the base of at least two of the triangularly shaped side members in the second set and means connected with said bottom forming members providing an intersecting folded construction thereof; whereby folding the blank produces an eight sided carton for four glasses having four pockets on the bottom and four pockets on the top thereof.

4,091,927

SEPARABLE PACKAGING AND DISPLAY SYSTEM

Thomas Jake Lunsford, 378 W. Madison, El Cajon, Calif. 92020

Filed Sep. 15, 1976, Ser. No. 723,505
Int. Cl.[2] B65D *51/24, 73/00*
U.S. Cl. 206—459 **8 Claims**



1. A packaging and display carton, said carton comprising:
a first substantially rectangular unitary plane sheet of durable flexible material having a first portion thereof shaped to define a packaging chamber and an adjacent plane labeling support surface, said chamber being defined by continuous uninterrupted walls formed of and rising from said first sheet, at least a portion of said wall being a double wall having inner and outer walls connected by an upper inverted U-shaped rim,
a second substantially rectangular unitary sheet of durable flexible transparent material shaped to define a closure cavity and display window, said cavity being defined by walls extending upward from the plane surface of said sheet and having substantially the same shape as the outer walls of said packaging chamber and fitting over the walls of said packaging chamber with a snug fit thereby providing a tight fitting sealing engagement with a vacuum lock therebetween, said second sheet including means defining a labeling display window covering said labeling support surface, and
a labeling sheet disposed between said first and second sheets and including an opening therethrough through which the walls of said packaging chamber extend.

4,091,928

FLOWER PLANTER KIT

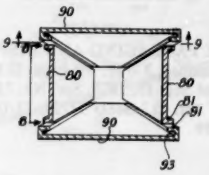
Anthony J. Bernardo, Brookline, Mass., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Dec. 7, 1976, Ser. No. 748,377
Int. Cl.[2] B65D *69/00*
U.S. Cl. 206—575 **1 Claim**

1. A kit for forming a planter comprising a box that houses material and serves as a mold form for use in constructing the planter from a mixture of cement and beach stones, said box shaped to serve as a mold for the base section of the planter, in which
the box initially houses shaped mold forms, with said shaped mold forms in the form of four individual plates, each

fitted along opposed edges of each plate with means to detachably engage an edge of another said plate, such that when so mutually engaged, the plates form the four sides of a mold,

a first two of said plates formed on each of a pair of opposed edges with a U-shaped flange each bounding an open groove with the open grooves of said flanges substantially facing each other, with the second other two of each said plates formed on each of a pair of opposed edges with a



male flange bent substantially perpendicular to the plane of the plate, said male flanges extending in the same direction from the plate, and each of a size to snugly engage the walls of a groove of a U-shaped flange of a first plate, such that with each male flange of a second plate engaged in a U-shaped groove flange of a first plate, with the plates arranged to form four sides of a mold, the plates are engaged together to withstand individual movement away from each other, and from the center of the mold.

4,091,929

ICE CREAM CONTAINER

Bruce E. Krane, 1350 B Bluff Ave., Columbus, Ohio 43212

Filed Nov. 26, 1976, Ser. No. 745,379
Int. Cl.[2] B65D *5/54, 3/28*
U.S. Cl. 206—602 **2 Claims**

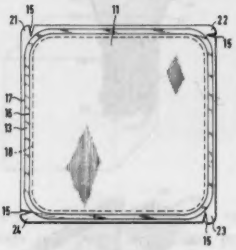
1. A container for ice cream or the like comprising a right cylindrical sidewall and having an open end, a lid interfitting with said open end, said sidewall having one or more peripheral rip-strips for separating an empty portion of said container from the balance of said container, each said rip-strip lying in a plane at right angles to the axis of said container and each having a peripheral discontinuity, said balance of said container then having a new open end with which said lid interfits, and readily destructable means for sealing each said rip-strip to the balance of the siewall comprising moisture impervious material overlying the juncture of said rip-strip and said sidewall on the inner surface of said sidewall and being fixed to said rip-strip, said material extending axially of said container a distance greater than said rip-strip spanning said rip-strip and the resulting cut edges of said sidewall container.

4,091,930

CONTAINER

Norbert Buchner, Winnenden-Hofen, and Werner Brose, Rommelshausen, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 15, 1977, Ser. No. 768,815
Claims priority, application Germany, Feb. 18, 1976, 7604691[U]
Int. Cl.[2] B65D *5/54, 17/04*
U.S. Cl. 206—605 **6 Claims**



1. In a container which includes

a dish having a base and an upstanding wall and which defines an open-ended interior volume, said wall defining an outstanding flange around the periphery of the open end of said dish, and

a cover for closing the open end of said dish, said cover being sealable to said flange by the application of heat to form a continuous welded bead on an intermediate area of said flange when sealed, the improvement comprising:

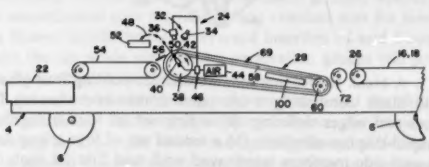
said dish and said cover have a periphery in the shape of a polygon and on at least each but one corner of said polygon, there is provided in said flange and said cover a kerf making an incision in said flange and said cover and extending from the periphery of said flange and said cover along one side of the corner to a point substantially adjacent to said bead, said kerf pointing in the direction of a zone lying between and jointly defined by the inner edge of said flange and said welded bead; whereby, when said corner is pulled away from said dish, said flange together with the overlying portion of said cover are separated from said dish along said zone.

4,091,931

FRUIT SORTING METHOD AND APPARATUS

Robert L. Button, deceased, late of Winters, Calif. (by Martha Willis Button, executrix), and Antone J. Turkovich, Davis, Calif., assignors to Robert L. Button, Winters, Calif.

Filed Sep. 17, 1975, Ser. No. 614,043
Int. Cl.[2] B07C *5/342*
U.S. Cl. 209—73 **8 Claims**



1. A tomato harvester comprising:

a frame movable over a tomato field;

means for gathering tomato vines and tomatoes from the field and for transporting them onto the harvester;

means on the harvester for separating the tomatoes and the vines;

means for discharging the vines from the harvester;

means for directing the separated tomatoes to a first location on the harvester;

aligning conveyor means mounted to the frame for receiving tomatoes at the first location, aligning the tomatoes into a plurality of side by side parallel rows of serially arranged tomatoes and for transporting the tomato rows in a downstream direction from the first location;

the conveyor being defined by a plurality of side by side, spaced apart elements defining opposing, tomato supporting surfaces and a gap therebetween, the gap extending over the full length of the conveyor,

a detection station including a photo cell for each tomato row for inspecting each tomato in such row and for generating a reject signal in response to the presence of a cull at the detection station;

a cull ejector for each row positioned beneath the corresponding row and in alignment with the corresponding gap at a second location, the ejector including a power-driven plunger extensible through the gap into contact with a cull detected at the detection station and means for reciprocating the plunger between its extended and its retracted position in which the plunger does not contact culls or tomatoes carried past it by the aligning conveyor;

means operatively coupled with the cell and the reciprocating means for actuating the retracting means in response to a reject signal when the corresponding cull passes the plunger;

means orienting the plunger so that it reciprocates in a downstream and upwardly inclined direction for the ejection of the culls along an upwardly inclined, downstream oriented trajectory;

transport means positioned downstream of the plunger for transporting good tomatoes to a collection point, the transport means including means for substantially continuously supporting the good tomatoes during their transport between the second location and the collection point; and

a cull conveyor mounted to the frame generally downstream of the second location at a vertical elevation above the transport means and in the ejected cull trajectory for receiving ejected culls and discharging them.

4,091,932

CONTROL DEVICE FOR VIAL FILLING MACHINES

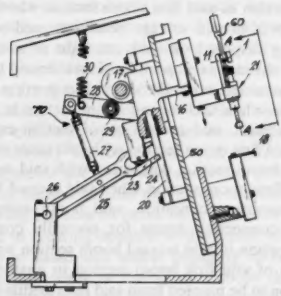
Federico Bigarella, Via S. Carlo 32, Segrate (Milano), Italy

Filed Aug. 19, 1976, Ser. No. 715,915

Claims priority, application Italy, Feb. 12, 1976, 20108 A/76

Int. Cl.[2] B07C *1/10*

U.S. Cl. 209—82 **8 Claims**



1. A device for separating capped containers from a series of capped and uncapped containers comprising, a support, a slide movable to and fro on said support, drive means associated with said slide to move it on said support, a jaw pivotally mounted on said slide, a pin slidable on said slide between said jaw from a first position in which said pin opens said jaw to a second position in which said pin closes said jaw, setting means aligned with said pin to contact said pin and move it to said first position during each fro movement of said slide on said support, said slide being movable toward each one of the series of containers in succession to allow a portion of said pin to enter each one of the series of uncapped containers and remain in its first position with said jaws open, and to cause said pin to be abutted against each one of the capped containers in the series for moving said pin into its second position to allow said jaws to close about the capped container and separate it from the series of containers during each fro movement of said slide.

4,091,933

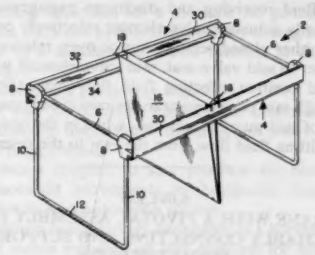
HANGING FILE SUPPORT FRAME

Robert L. Alexander, Erlanger, Ky., assignor to Hunt Manufacturing Co., Philadelphia, Pa.

Filed Feb. 10, 1977, Ser. No. 767,577

Int. Cl.[2] B42F *15/00*

U.S. Cl. 211—204 **15 Claims**



1. A hanging file folder support frame comprising:

a pair of channels for supporting file folders each channel having a web portion and opposed spaced hook portions,

four corner fittings each having a bead engaged by one of said channel hook portions and an integral latch below said bead and engaging the other of said channel hook portions for releasably locking the channels to the fittings on rotation of said channels to move the said other channel hook portions into engagement with the latches, and

means supporting the corner fittings in a spaced relation in an elevated position.

4,091,934

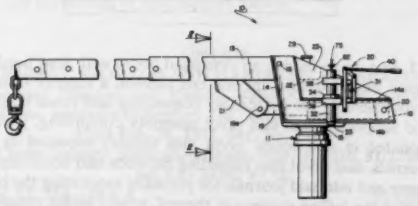
SWIVEL MOUNTED PUMP WITH INTEGRAL VALVE MEANS

Roy E. Rice, Uhrichsville, Ohio, assignor to Ruger Equipment, Inc., Uhrichsville, Ohio

Filed Apr. 1, 1977, Ser. No. 783,829

Int. Cl.[2] B66C *23/00*

U.S. Cl. 212—8 R **18 Claims**



1. Fluid pump apparatus for a mine crane having a fluid operated ram and a fluid reservoir, the pump apparatus comprising

a supporting framework attachable to the crane,

an elongated support spindle mounted on said supporting

framework and having an axially extending fluid passageway formed therein, a reservoir port and a ram port communicating with said passageway in axially spaced relationship to each other and connectable by respective fluid conduits with the reservoir and ram,

manually operated fluid pump means mounted on said spindle for revolution about the axis thereof, said pump means including a fluid receiving passageway and a fluid discharge passageway coupled in fluid communicating relationship with the axial passageway of said spindle in axially spaced relationship to each other, and manually actuated fluid displacing means selectively operable to displace fluid from the receiving passageway and out of said discharge passageway, and

manually operated, directional flow control valve means incorporated in said spindle for selectively controlling fluid flow with respect to the reservoir and the ram ports thereof and said pump means, said valve means including a valve seat formed in the spindle's axial passageway intermediate said reservoir and ram ports thereof and intermediate the coupling of said axial passageway with said fluid receiving and discharge passageways, and a manually actuated valve element selectively positionable into either closed relationship or open relationship with respect to said valve seat, said valve element when in the closed position effecting fluid flow from the reservoir through said pump means to the ram in response to operation of said pump means and, when in the open position, permitting fluid flow from the ram to the reservoir.

4,091,935

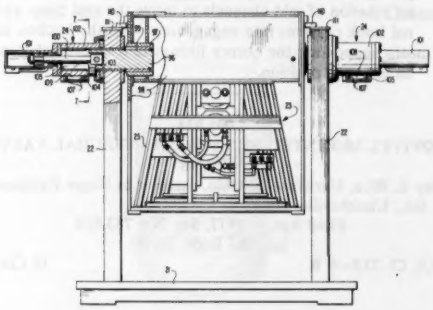
CRANE WITH A PIVOTAL ASSEMBLY FOR DETACHABLY CONNECTING AND SUPPORTING A BOOM THEREON

Reginald P. Whittingham, Saint Thomas, Pa., assignor to Walter Kidde & Company, Inc., Clifton, N.J.

Division of Ser. No. 548,149, Feb. 7, 1975, Pat. No. 3,954,193. This application Oct. 24, 1975, Ser. No. 625,382

Int. Cl.² B66C *23/62*

U.S. Cl. 212—144 **8 Claims**



1. In a crane having an elongated boom with load handling means mounted adjacent one end thereof, a support frame, a pivot assembly for detachably connecting said crane boom to said support frame, said pivot assembly comprising, journals mounted in said boom, pivot pins slidably mounted in said journals, said pivot pins extending between said boom support frame and into said journals for pivotally supporting the boom during the luffing movement thereof, power means connected to said pivot pins for retracting said pins from the operative position in said journals to an inoperative retracted position from said journals, said pivot pins and said power means mounted on said support frame at the opposite sides of said boom and said pivot pins being axially slidable on the support frame whereby they may be retracted outwardly from said journals and away from the sides of the boom and from each other to release the boom from the support frame, positive locking means insertable into the path of movement of said pivot pins to prevent accidental retraction thereof while in the operative position, and crown support means mounted on one of said support frame and boom, and cooperating means mounted on the other of said support frame and boom and engageable with said crown support means allowing luffing movement of said boom during the normal operation thereof and allowing transfer of the weight of the boom directly to the support frame following retraction of the pivot pins from said journals.

4,091,936

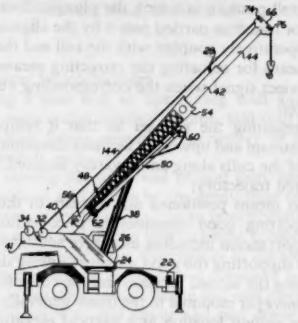
APPARATUS FOR EXTENDING A BOOM ASSEMBLY

James G. Wuerflein, and Charles R. Spence, both of Winona, Minn., assignors to The Warner & Swasey Company, Cleveland, Ohio

Filed Nov. 15, 1976, Ser. No. 742,009

Int. Cl.² B66C *23/62*

U.S. Cl. 212—144 **13 Claims**



1. An apparatus comprising a first longitudinally extending boom section having an inner and outer end portions, a second longitudinally extending boom section having inner and outer end portions, said second boom section being movable relative to said first boom section between a storage condition, an intermediate condition and an operating condition, said second boom section being disposed to one side of said first boom section with the inner end portion of said second boom section located adjacent to and spaced axially inwardly of the outer end portion of said first boom section and with the outer end portion of said second boom section located adjacent to the inner end portion of said first boom section when said second boom section is in said storage condition, said second boom section being disposed on said one side of said first boom section with the inner end portion of said second boom section pivotally connected with the outer end portion of said first boom section when said second boom section is in said intermediate condition, said second boom section extending outwardly of said first boom section with said inner end portion of said second boom section connected with said outer end portion of said first boom section when said second boom section is in said operating condition, said boom assembly further comprising connecting means for pivotally connecting said inner end portion of said second boom section with said outer end portion of said first boom section to enable said second boom section to be pivoted from said intermediate condition to said operating condition, means for guiding movement of said second boom section between said storage and intermediate conditions, said means for guiding movement of said second boom section including track means connected with one of said boom sections and follower means connected with the other of said boom sections for engaging said track means, said track means having inner and outer end portions with an intermediate portion which extends away from said inner end portion of

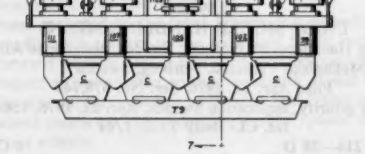
said track means toward said outer end portion of said track means in a direction toward the central axis of said first boom section, said follower means being disposed in engagement with the intermediate portion of said track means to guide movement of said second boom section toward said first boom section during a portion of the movement of said second boom section from said storage condition to said intermediate condition, said follower means being spaced apart from said track means when said second boom section is in said intermediate condition to enable said second boom section to be pivoted from said intermediate condition to said operating condition without interference between said track means and said follower means.

4,091,937

APPARATUS FOR SETTING UP AND LOADING A TRAY

Rodney K. Calvert, Dunwoody, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Oct. 8, 1976, Ser. No. 730,747
Int. Cl.[2] B65G *65/38*
U.S. Cl. 214—1 BB 4 Claims



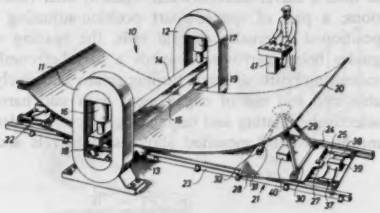
1. An article handling mechanism for a plurality of contiguous articles, each having substantially vertically disposed axes and outwardly and upwardly tapered side walls and shaped to define voids therebetween, said mechanism comprising a generally horizontally disposed support plate, a plurality of horizontally spaced article engaging elements journalled in said support plate and arranged so that a plurality of said article engaging elements are disposed about the periphery of each article, each of said elements being angularly movable about a substantially vertical axis and each element having at least one article engaging surface and at least one article clearing surface disposed about its periphery, said article engaging surfaces being generally complementary to the configurations of the side walls of the adjacent articles respectively and said elements being movable vertically into and out of said voids when said elements are disposed with their article clearing surfaces in clearing relation to the adjacent articles, operating means including a common operating element and a plurality of cranks respectively interconnected with each of said article engaging elements and with said common operating element for imparting limited angular movement thereto to cause said article clearing surfaces to move from an initial position adjacent to and in clearing relation with respect to the adjacent articles and to cause said article engaging surfaces firmly to contact the side walls of the articles about the peripheries thereof, fixed abutment means disposed to engage said operating element to limit movement thereof in predetermined fixed article engaging and in article clearing positions respectively such that the article engaging surfaces of the article engaging elements which are disposed about each article are caused to engage the tapered article side walls intermediate the tops and bottoms thereof when in article engaging positions, and transport means for moving said elements and articles.

4,091,938

DEVICE FOR HANDLING LARGE WORKPIECES

Sten Trolle, Ystad, Sweden, assignor to AB Carbox, Ystad, Sweden

Filed Jul. 8, 1976, Ser. No. 703,641
Claims priority, application Sweden, Aug. 1, 1975, 75 08727
Int. Cl.[2] B25J *11/00*
U.S. Cl. 214—1 F 10 Claims



1. Handling apparatus for a machine for processing large workpieces, such as a hydraulic press for working metal sheets supported by a handling apparatus external to the machine, comprising:

means defining a processing station;

at least one horizontally displaceable platform which is horizontally displaceable towards and away from said processing station;

guide means coupled to said platform for restricting its displacement movements to horizontal displacements relative to said processing station;

said platform being further swingable in a horizontal plane;

support means mounted on said platform for non-slidingly engaging a surface of the workpiece and for supporting at least a portion of the workpiece;

means including hydraulic means coupled to said support means for controlling at least the vertical position of support of the workpiece and for absorbing the reactional movements carried out by the portions of the workpiece supported by the handling apparatus in response to the processing by the machine;

means coupled to said hydraulic means for sensing the working pressure in said hydraulic means and for regulating the pressure in said hydraulic means in response to the sensed pressure values to maintain the pressure in said hydraulic means within a predetermined range;

further hydraulic means coupled to said platform for swinging said platform in said horizontal plane; and

means coupled to said further hydraulic means for sensing the working pressures in said further hydraulic means and for regulating the pressures in said further hydraulic means in response to the sensed pressure values to maintain said pressures in said further hydraulic means within predetermined ranges;

thereby supporting said workpiece with a restricted freedom of movement of said support means.

4,091,939

BARREL STORAGE AND HANDLING APPARATUS

Kunitami Shimizu, and Yoshiro Kaisaku, both of Nirazaki, Japan, assignors to Suntory Ltd., Osaka, Japan

Filed Feb. 24, 1977, Ser. No. 771,684
Claims priority, application Japan, Mar. 3, 1976, 51-22955
Int. Cl.[2] B65G *47/00*
U.S. Cl. 214—16.4 A 11 Claims

1. A system for storing and orienting barrels in store-racks, with their plugs positioned at the tops of said barrels, respectively, comprising:

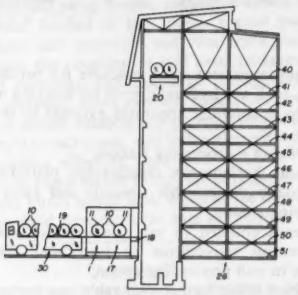
a position-presetting station;

a stand-by station adjacent to said position-presetting station;

a storage station adjacent to said stand-by station, said storage station including a plurality of store-racks and a mov-

able stacker crane interposed between said racks and said stand-by station for transporting barrels therebetween;

said position-presetting station including a pair of spaced rails for receiving rolling barrels thereon one after another; a pair of stoppers spaced apart in the direction of rolling of said barrels on said rails, each of which are pivotally movable within a generally vertical plane between raised and lowered positions and which are adapted to hold a barrel therebetween when in their raised positions; a pair of spaced-apart position-adjusting guides positioned externally of said rails, the spacing of said guides being narrower towards a barrel-circumference measuring position; barrel turning means selectively movable into and out of engagement with said barrels for selectively rotating said barrels; a plug-position-detecting means pivotally mounted above said barrels and positioned above said barrel turning means for detecting a plug on a barrel; measuring rollers pivotally mounted above said barrels and above said barrel turning means, said measuring rollers being adapted to measure a maximum circumference of a respective barrel and a circumference of said respective barrel at the points where said respective barrel contacts said rails on which said barrel rolls from said position-presetting station to its desired final position in said racks; and a barrel position-calculating control circuit electrically connected to said measuring rollers and electrically connected to said plug-position-detecting means, for stopping the operation of said barrel turning means when said plug is oriented at a predetermined position whereby when said barrels are transported to their respective desired final position in said store-racks by said stacker crane, said plugs will be positioned at the uppermost position of said barrels.



4,091,940

SILO UNLOADER

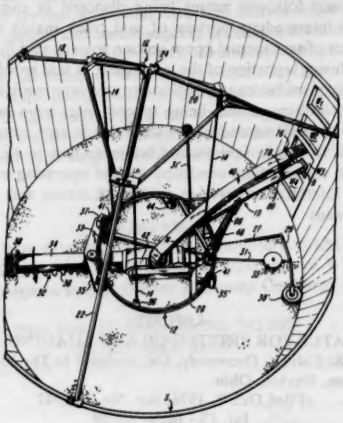
Gregory Schmiesing, R.R. No. 1, New Bremen, Ohio 45869

Filed Aug. 18, 1976, Ser. No. 715,451

Int. Cl.[2] B65G *65/38*

U.S. Cl. 214—17 DB **17 Claims**

1. A silo unloader including a frame adapted for mounting so as to resist rotation, material moving means mounted on and for rotation relative to said frame, said material moving means being operative to remove and deliver silage from an underlying bed thereof to an overlying spout, said spout being in overlying relation to a torque arm and connected therewith, means defining a pivotal connection between said torque arm and said frame, means for a powered drive of said material moving means for rotation thereof with respect to said frame and control means in connection with said torque arm including means responding to a predetermined lateral stress applied to said torque arm to interrupt the operation of said drive means.



4,091,941

INGOT MOULD HANDLING MEANS

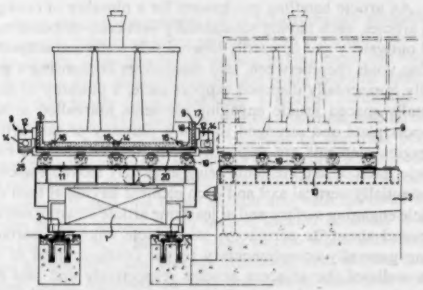
Bo Georg Hammarqvist, Norberg, Sweden, assignor to AB Norbergs Mekaniska Verkstad, Norberg, Sweden

Filed Apr. 21, 1976, Ser. No. 678,749

Claims priority, application Sweden, Apr. 21, 1975, 75045807

Int. Cl.[2] B60P *1/52, 1/64*

U.S. Cl. 214—38 D **9 Claims**



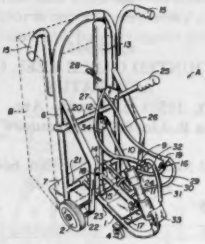
1. Apparatus for transferring a teeming unit, adapted to hold a plurality of moulds and including a base plate, between a plurality of working stations comprising a car adapted to travel along a predetermined path, said stations being arranged on opposite sides of the path in spaced parallel relation, fixed beds of rollers mounted on the car and at the various stations at identical elevations for movably supporting the base plate of the teeming unit, transfer means mounted on the car for selectively engaging the base plate of the unit to laterally transfer the unit along the roller beds between the car and stations on either side of the car, said transfer means comprising a horizontal arm mounted at each end of the car for lateral movement with respect to the direction of travel of the car, at least one operable plunger mounted on each arm and at least one cooperating socket for receiving each plunger located in the base plate of the unit, and means for actuating the plungers and the arm to laterally transfer the unit between the car and a station.

4,091,942

POWER ASSISTED HAND TRUCK

James A. Shelton, 1208 E. 56th St., Tacoma, Wash. 98404

Filed Jan. 21, 1977, Ser. No. 761,194
Int. Cl.[2] B60P *1/18*
U.S. Cl. 214—148 7 Claims



1. A hand truck comprising:

a pair of laterally disposed front wheels;

a generally vertically extending rack having a front side and a back side, said rack being pivotably mounted to the front wheels proximate the lower end of said rack so that the rack is pivotable about the axis of the front wheels;

a generally horizontal load bearing member mounted to the lower end of the rack and extending outwardly from the front side of the said lower end;

a frame mounted to the front wheels and extending rearwardly with respect to the rack, said frame including a forward portion and a rearward portion movable with respect to one another so that the length of said frame in the rearward direction is adjustable, said frame including wheel means on the underside thereof spaced from the front wheels;

a bottom actuator spanning the forward and rearward portions of the frame to control the length of said frame;

a top actuator having one end attached to the rearward portion of the frame and a second end attached to the rack at a position above the lower end of said rack; and

means for extending the bottom actuator and contracting the top actuator to project the lower end of the rack and the front wheels forwardly and tilt the rack backwardly to lift a load resting on the load bearing member for transportation thereof with the hand cart, and means for contracting the bottom actuator and extending the top actuator to lower the load.

4,091,943

METHOD AND APPARATUS FOR LOADING A VEHICLE WITH BALES OF CROP MATERIAL OR SIMILAR UNITS

Niels Bay-Schmith, Svanholm, Skibby, Denmark (4050)

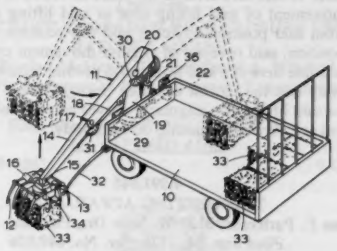
Filed Sept. 29, 1975, Ser. No. 617,537
Claims priority, application Denmark, Sept. 27, 1974, 5100/74
Int. Cl.[2] B65G *57/00*
U.S. Cl. 214—152 8 Claims

1. A method for selectively loading and unloading a vehicle with successive bales of crop material or similar units by means of movable gripping means of a loading apparatus mounted on said vehicle, said method comprising

(a) automatically moving said gripping means during the loading mode in relation to said vehicle and said crop unit between unit engaging and unit discharging positions, gripping said units successively, transporting said units to a predetermined discharge position on said vehicle, and releasing said unit at said discharge position thereon,

(b) automatically moving said gripping means during the unloading mode in relation to said vehicle and said crop unit between unit engaging and unit discharging positions, gripping said units successively and transferring said units to a predetermined discharge position off said vehicle and releasing said unit at said discharge position,

(c) controlling the movement of the gripping means between said positions by means of programmable automatic control means, and



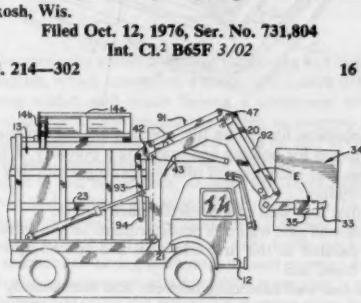
(d) selectively positioning said vehicle while said gripping means are being moved automatically between said positions.

4,091,944

FRONT END LOADER REFUSE COLLECTION BODY

Cyril R. Gollnick, Oshkosh, Wis., assignor to Leach Company, Oshkosh, Wis.

Filed Oct. 12, 1976, Ser. No. 731,804
Int. Cl.[2] B65F *3/02*
U.S. Cl. 214—302 16 Claims



1. In a front-end loading refuse collection system for collecting and transporting refuse in a motor vehicle, said system including in combination:

a body adapted to receive refuse through an opening therein;

a pair of lifting arms pivotally mounted to opposing sides of said body for coacting in vertical swinging movement between a bottom position in which the free ends of said arms extend forwardly of the front of said body to a top position in which the free ends of said arms extend above the top of said body, each said lifting arm generally being curved and including a concavely curved bottom surface defining an open area beneath said arm for providing user access to said motor vehicle regardless of the operating position of said lifting arm;

a pair of fork arms, one form arm pivotally mounted on the free end of each lifting arm, for coacting in vertical swinging movement from a position extending forwardly of the free ends of said lifting arms when in said bottom position to a position extending rearwardly of the free ends of said lifting arms when in said top position; and

an improvement comprising:

mechanical linkage means including a pair of linkages, each pair including a plurality of operatively connected linking members pivotally mounted adjacent one end thereof, to said body and pivotally mounted adjacent an opposing end thereof to the respective ones of said fork arms, said linkages further being operatively connected on at least one pivot point on the respective ones of said lifting arms and positioned therealong to generally follow the curva-

ture thereof, said linkage means angularly moving said fork arms in a direction opposite the angular movement between said lifting arms and said body as said lifting arms move from said bottom position to a position adjacent said top position thereof; and

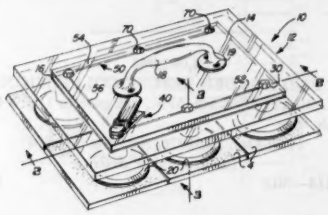
said mechanical linkage means reversing the angular movement of said fork arms to the same direction as the angular movement of said lifting arm as said lifting arms move from said position adjacent said top position to said top position, said reversal of angular movement commencing as a line between said lifting arm pivotal mounting on said body and the closest adjacent linkage means pivot point on said lifting arm angularly moves across the axis of said linkage pivotal mounting on said body.

4,091,945

TILE SETTING APPARATUS

Thomas P. Patterson, 3138 W. Sells Dr., Phoenix, Ariz. 85017

Filed Jan. 14, 1976, Ser. No. 649,026
Int. Cl.² B65G *65/38*
U.S. Cl. 214—309 **18 Claims**



1. Apparatus for setting tile, comprising, in combination,

box means for holding and orienting a plurality of layers of tiles, and each layer of tiles comprising a plurality of tiles, including

a first side wall of a predetermined length,

a second side wall of a predetermined length substantially parallel to the first side wall and spaced apart therefrom, and

an end wall extending between and substantially perpendicular to the first and to the second side walls, said side walls and end wall defining a compartment of a predetermined width and length for holding a plurality of layers of tiles in a predetermined orientation:

tile setter means for securing a plurality of tiles comprising a layer of tiles and removing the plurality of tiles from the box means to set the plurality of tiles at a desired location and for releasing the plurality of tiles substantially simultaneously, including

plate means including a portion having a predetermined width and length of substantially the same width and length as the compartment for insertion into the compartment,

suction cup means including a plurality of suction cups secured to the plate means in a predetermined orientation corresponding to the orientation of the tiles in a layer of tiles in the box means for securing to the said tiles in a layer upon appropriate evacuation of air between the tiles and the suction cups, each suction cup having two concavities when not secured to a tile including an upper flange portion of a generally hemispherical configuration defining an inner concave portion, and a lower flange portion extending outwardly and downwardly from the upper flange portion defining an outer concave sealing lip portion, and each concave portion being substantially planar when secured to a tile;

air chamber means in the plate means communicating with each cup of the plurality of suction cups;

fastening means for securing the suction cup means to the plate means and including a shank extending from the plate means to each suction cup and an axially extending conduit in the shank communicating with each cup and an aperture extending radially from the conduit to the air chamber means for providing communication between the air chamber means and each cup; and

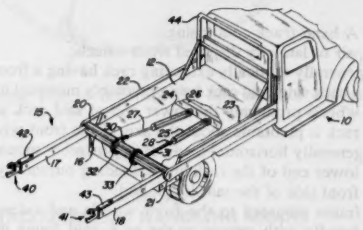
valve means communicating with the air chamber means for selectively releasing air from and admitting air to the air chamber means.

4,091,946

TRUCK-MOUNTED CABLE REEL HANDLING APPARATUS

Robert W. Kraeft, 10581 E. Dorado Ave., Englewood, Colo. 80110, and John B. Lloyd, 2083 Pommard Dr., Creve Couer, Mo. 63141

Filed Mar. 8, 1976, Ser. No. 664,770
Int. Cl.² B60P *1/48*
U.S. Cl. 214—518 **8 Claims**



1. In apparatus for loading and unloading spindle mounted cargo such as cable reels and the like relative to an elevated platform wherein at least one lift assembly includes an elongated shaft having a plurality of arms attached thereto in spaced parallel relation to one another on said shaft with each said arm including means remote from said shaft for receiving a cargo spindle, said arms extending in a common direction perpendicular to the length of said shaft, said shaft having a drive member in radially surrounding relation to the elongated central axis of said shaft, means mounting said shaft with the length thereof parallel to and rotatable with respect to the surface of the flatbed, the improvement comprising:

rotational drive means for controlling the rotational position of said shaft including a drive member for said shaft having a sprocket gear, coupling means including a chain at least partially engaging said sprocket gear, and

power source means including a pair of fluid-actuated rams having the pistons thereof connected to respective ends of said chain, and means energizing said rams for establishing synchronous, oppositely directed movement of said ram pistons, said energizing means including flow control means having a source of fluid under pressure establishing communication between said rams whereby fluid exhausted from one ram is applied directly under pressure to said other ram whereby to establish oppositely directed movement of said ram pistons, and bypass means for selectively bypassing fluid exhausted from the one ram to said fluid supply source in excess of that required to establish oppositely directed movement of the other of said ram pistons.

4,091,947

TRACTOR MOUNTED MULTIPLE BALE CARRIER

Raymond C. Fischer, Hinsdale, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Nov. 22, 1976, Ser. No. 743,836
Int. Cl.² B60P *1/16*
U.S. Cl. 214—766 **2 Claims**

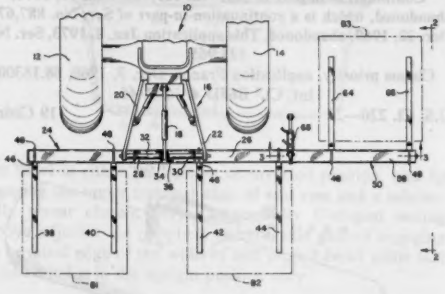
1. A multiple bale carrier adapted for mounting on a tractor

having a pair of rear drive wheels and a three-point hitch between the drive wheels, said carrier comprising:

an elongated frame mounted on the three-point hitch behind the drive wheels and extending transversely to the forward direction of travel of the tractor;

at least one pair of bale-supporting tines on said frame extending rearwardly for supporting a bale thereon;

means for selectively lowering said frame to a bale pickup position wherein said tines may be inserted under a bale when the tractor is moved rearwardly and for selectively raising said frame to a bale transport position;



a bale carrier subassembly mounted on said frame and including a pair of bale-supporting tines extending forwardly of said frame outboard of one of said drive wheels so that a bale may be carried thereon alongside the tractor, said frame including an elongated tube having a cylindrical end section extending transversely beyond said one of said drive wheels, said subassembly being mounted on said cylindrical end section for pivotal movement about the longitudinal axis of said end section;

and means powered by said tractor interconnected between said tube and said subassembly for pivoting the subassembly to raise and lower a bale carried thereon outboard of said one drive wheel.

4,091,948

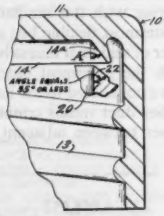
LINERLESS CONTAINER CLOSURE

John D. Northup, 2460 Underhill Rd., Toledo, Ohio 43615

Continuation-in-part of Ser. No. 666,594, Mar. 15, 1976, abandoned. This application Aug. 12, 1976, Ser. No. 713,679

Int. Cl.[2] B65D *53/00*

U.S. Cl. 215—222 **5 Claims**



1. A container-closure combination including a container having a neck portion terminating in a tapered sealing surface making an angle not greater than 55° to the longitudinal axis of the container, and a closure including an upper panel spanning the neck portion of the container, a resilient tapered sealing fin depending from the lower surface of said panel and extending downwardly and outwardly at an angle from 10° to 20° less than the angle made by said container sealing surface, and means on said container and said closure to bring said tapered fin into sealing engagement with said tapered sealing surface, the resiliency and mass of said fin being such that said seal is tight in accordance with the specification of National Formulary XIV, pp. 888–889 when the closure is applied with a sealing force not greater than that created by an application torque of seven inch-pounds for a 28 mm. closure.

4,091,949

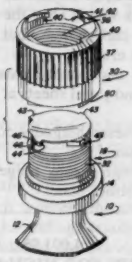
ANTIBACKOFF THREADED RING CLOSURE USING RATCHET MEANS

Thomas A. Fowles, McHenry, Ill., and David A. Winchell, Twin Lakes, Wis., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Mar. 14, 1977, Ser. No. 777,751

Int. Cl.[2] B65D *41/62*

U.S. Cl. 215—251 **9 Claims**



1. A hermetically sealed container for storing and dispensing sterile liquids, which comprises: a bottle with a neck defining a dispensing outlet, said bottle having a transverse abutment means on the neck surrounding the outlet; an overcap having a cylindrical sidewall and a top wall fitted on said bottle neck enclosing said dispensing outlet, said overcap being hermetically sealed to said bottle neck; an outer ring threadedly interfitted over said overcap and adapted for rotation in the downward direction to exert a downward force against said abutment means to jack said overcap off said bottle neck; and a ratchet mechanism having teeth on both said overcap and said outer ring so as to prevent rotation of the outer ring in a direction which would cause the outer ring to move away from the bottle neck.

4,091,950

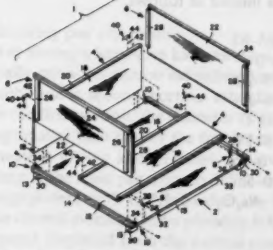
HINGED BIN

Daniel R. Craven, Orinda, Calif., assignor to Pennsylvania Pacific Corporation, Warminster, Pa.

Filed Aug. 8, 1977, Ser. No. 822,558

Int. Cl.[2] B65D *7/24, 9/18*

U.S. Cl. 217—47 **12 Claims**



1. A hinged knock-down returnable self-locking bin comprising

a base panel, first and second side panels, and first and second end panels,

said base panel including a deckboard with runners depending therefrom,
each of said side panels including a side panel sheet,
a side panel bottom cleat mounted on the outer surface of the bottom portion of the side panel sheets and being shorter than the width of the side panel sheets,
a side panel top cleat mounted on the outer surface of the top portion of the side panel sheets and having ends that are flush with ends of the side panel sheets,
each of said end panels including an end panel sheet,
an end panel top cleat mounted on the top outer surface of the end panel sheets,
bottom cleat means adapted to be in abutting position between the end panel stacking cleats and the base panel when the bin is erected,
a pair of end panel vertically-positioned stacking cleats mounted on the outer surface of the end panel sheets and having top ends which abut the end panel top cleat and having bottom ends which abut the bottom cleat means when the bin is erected,
a pair of vertical end panel cleats mounted on the inside surface of the end panel sheets at the side edges of the end panels,
side panel hinge means hingedly connecting the side panels to the bottom panel,
and end panel hinge means hingedly connecting the end panels to the bottom panel.

4,091,951

LAMPS FOR HIGH POWERS

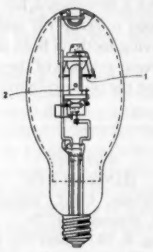
Anthonie Louis Zijlstra, and Anton Boekkooi, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 26, 1976, Ser. No. 745,478

Claims priority, application Netherlands, Dec. 15, 1975, 7514565

Int. Cl.[2] H01J *61/30*

U.S. Cl. 220—2.1 R **1 Claim**



1. A lamp characterized in that the envelope, consists of glass the composition of which lies within the range in weight % which is limited as follows:

SiO_2 — 65–85
Al_2O_3 — 0–3
Na_2O —5–20
K_2O — 0–2
B_2O_3 — 0–1
CaO — 5–15
MgO — 0–5
BaO — 0–5
$Sb_2O_3 + As_2O_3$ — 0–1,5
SO_3 — 0–1.

where Na_2O may be wholly or partly replaced equimolarly by Li_2O and where the total of contaminations and coloured oxides is ≦ 2, which envelope has for a preponderating part at the surface a layer of at least 30 μm thick in which Na^+- and/or Li^+-ions are replaced by larger ions in such a proportion that in the layer there is a compressive stress which is at least 2000 nm/cm = approximately 7 kg/mm^2.

4,091,952

TANK STRUCTURE FOR THE STORAGE AND DISTRIBUTION OF SEVERAL FLUIDS, PARTICULARLY HYDROCARBONS

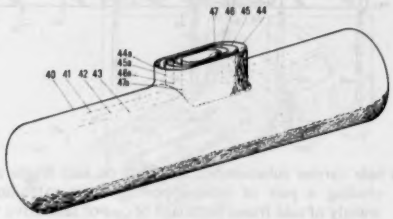
Pierre Capdevielle, Garches, and Francois Kermarrec, Rueil-Malmaison, both of France, assignors to Institut Francais du Petrole des Carburants et Lubrifiants and Societe Anonyme Pour Tous, Appareillages Mecaniques (Satam), France

Continuation-in-part of Ser. No. 107,740, Jan. 19, 1971, abandoned, which is a continuation-in-part of Ser. No. 887,679, Dec. 23, 1969, abandoned. This application Jan. 8, 1973, Ser. No. 321,965

Claims priority, application France, Dec. 3, 1968, 68.183004

Int. Cl.[2] B65D *4/16, 2/46*

U.S. Cl. 220—22 **19 Claims**



1. A tank for the storage and distribution of a plurality of fluids comprising a container, a plurality of flexible bags housed in said container and formed by membranes of very small stiffness, each flexible bag being sized sufficiently large to substantially fill the entire internal volume of said container when filled with fluid, said plurality of flexible bags being arranged one inside the other so as to define a plurality of variable volume chambers including an auxiliary chamber and a plurality of storage chambers, said plurality of variable volume chambers separated from one another by said membranes whereby the pressures of the fluids in the different variable volume chambers are substantially equalized, said auxiliary chamber maintaining the fluids in said storage chambers under substantially steady pressure, wherein the auxiliary chamber is formed between the outermost flexible bag and the bag adjacent to said outermost bag, each flexible bag being provided with an inlet sleeve, the inlet sleeves on the respective flexible bags surrounding one another, said tank further comprising a plurality of duct means, one of said duct means having an end portion communicating with the auxiliary chamber between the sleeve on the outermost flexible bag and the sleeve of the adjacent bag, another of said duct means having an end portion communicating with the innermost chamber and being surrounded by the sleeve connected to the innermost flexible bag, and at least one other duct means connected to at least one intermediate chamber between adjacent sleeves of adjacent flexible bags.

4,091,953

MULTI-PURPOSE BOWL SET

Robert H. C. M. Daenen, Aalst, Belgium, assignor to Dart Industries Inc., Los Angeles, Calif.

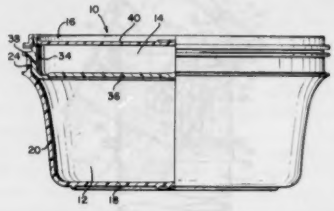
Filed Sep. 10, 1975, Ser. No. 612,155

Int. Cl.[2] B65D *21/02*

U.S. Cl. 220—23.86 **1 Claim**

1. A combined bowl arrangement and including: a first bowl member having upstanding sidewall portions that terminate in a peripherally extending rim having an inner wall that, although slightly flared, is of a substantially vertical disposition; a removable second bowl member of a planar size and shape

corresponding to that defined by the inner wall of the rim of said first bowl member and having substantially vertically disposed walls, the exterior surfaces of, which are segmented by a substantially horizontally extending peripheral lip, said lip being intermediately positioned along the walls of said second bowl at a point such that the second bowl will nest within said



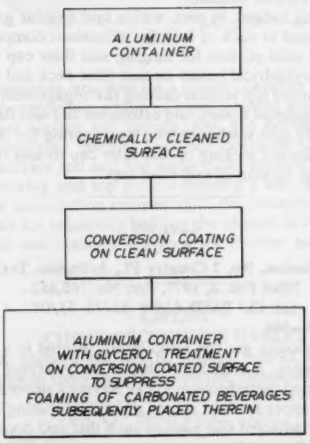
first bowl in either the upright or inverted position, said lip engaging the upper terminal edge of said rim; and a substantially planar closure having a generally U-shaped sealing groove adjacent the periphery thereof, said groove engaging the terminal edge of the walls of said second bowl while said second bowl is in the upright position only.

4,091,954

ALUMINUM CONTAINER HAVING INTERIOR SURFACE TREATED TO SUPPRESS FOAMING AND METHOD THEREFOR

Paul F. Wallace, New Kensington, Pa., assignor to Aluminum Company of America, Pittsburgh, Penn.

Filed Jun. 2, 1977, Ser. No. 802,634
Int. Cl.² B65D *25/14*
U.S. Cl. 220—470 **5 Claims**


ALUMINUM CONTAINER
CHEMICALLY CLEANED SURFACE
CONVERSION COATING ON CLEAN SURFACE
ALUMINUM CONTAINER WITH GLYCEROL TREATMENT ON CONVERSION COATED SURFACE TO SUPPRESS FOAMING OF CARBONATED BEVERAGES SUBSEQUENTLY PLACED THEREIN

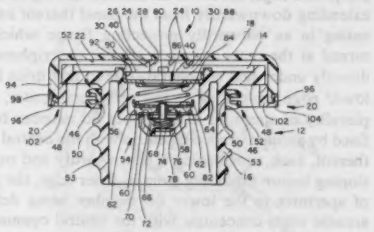
1. An aluminum container having an inner surface treated by first chemically cleaning the inner surface, then reacting the inner surface with a solution containing ions of phosphate, hexavalent chromium, and fluoride to form a conversion coating on the aluminum, and finally treating the conversion coated aluminum surface with an aqueous solution containing glycerol such that the inner surface is provided with a glycerol coating which will suppress foaming of carbonated liquids subsequently placed in said container.

4,091,955

PLASTIC FILLER NECK CAP

Paul H. Sloan, Sr., Nottawa, Mich., assignor to Stant Manufacturing Company, Inc., Connersville, Ind.

Filed May 24, 1977, Ser. No. 799,995
Int. Cl.² B65D *51/16*
U.S. Cl. 220—203 **9 Claims**



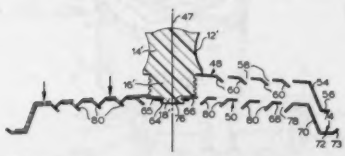
1. In a fuel cap comprising a closure having an axially outer portion and an axially inner portion for engaging and closing a fuel filler neck, and a shell providing a grip cover for said outer portion and a ring for rotatably fastening the shell and closure together, the improvement wherein the shell includes means providing a peripherally extending, axially outwardly facing surface and the ring includes means providing a peripherally extending, axially inwardly facing surface for engaging the axially outwardly facing surface of the shell and capturing the closure and shell rotatably together, at least one of the axially facing surfaces being interrupted to provide peripherally spacedapart engaging segments and clearance segments, and at least one of the shell and ring being provided with a plurality of peripherally and radially extending slots axially spaced from its axially facing interrupted surface, each slot being peripherally aligned with one of said engaging segments.

4,091,956

SPLATTER-PROOF LID

Fiore M. Vecchio, 9403- 118 Ave., Edmonton, Alberta, Canada (T5G 0N5)

Filed Jun. 21, 1977, Ser. No. 808,455
Int. Cl.² B65D *51/16*
U.S. Cl. 220—231 **1 Claim**



1. A lid for a cooking pan comprising:

a central member having a hand-grip knob on the upper end, a first externally threaded portion extending downwardly from the knob, and a second portion extending downwardly from the first portion, the diameter of the second portion being smaller than that of the first portion,

an upper lid member having a main panel, an outer rim, a central opening in the main panel cut to define one helical thread for engagement with the first externally threaded portion of the central member, and a plurality of apertures in the main panel displaced from the central opening,

and a lower lid member having a main panel, a central opening in the main panel adapted to receive the second portion of the central member, and a plurality of apertures in the main panel displaced from the central opening, the last-mentioned apertures being displaced from the first-mentioned apertures when the lid members are superim-

posed, and means for securing the lower lid member on the second portion,

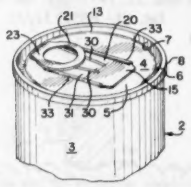
whereby the upper lid member can be rotated with respect to the knob to raise and lower it between a spaced position and a juxtaposed position vis-a-vis the lower lid member, the outer rim of the upper lid member extending downwardly from the main panel thereof and terminating in a peripheral edge, the lower lid member having an outer rim extending downwardly from the panel thereof and terminating in an outwardly projecting flange which is upturned at the outer margin to define a peripheral gutter directly under said peripheral edge so that drips from the lower edge are caught in the peripheral gutter, the said plurality of apertures in the upper lid member being defined by arcuate vents concentric with the central opening thereof, each vent having a downwardly and outwardly sloping louvre extending from its inner edge, the plurality of apertures in the lower lid member being defined by arcuate vents concentric with the central opening of the lower lid member, each vent of the lower lid member having a downwardly and inwardly sloping louvre extending from its outer edge, whereby when the lid members are juxtaposed the louvres of the vents in the upper and lower lid members can interlock in a V-shaped configuration to prevent passage of fumes.

4,091,957

TAPE SEAL FOR CONTAINER

Jens L. Moller, Darien, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Aug. 22, 1977, Ser. No. 826,283
Int. Cl.[2] B65D *41/02*
U.S. Cl. 220—260 **10 Claims**



1. A closure for a container end member having a center panel portion and a peripheral chuck wall and a chuck-receiving annular groove in the panel adjacent the chuck wall and having pour opening means disposed in close proximity to said groove;

a tape of rectangular shape having a body portion and a finger-grip lift portion folded over the body portion and forming therewith a fold juncture at one end of the body portion;

means for removably connecting said body portion to said center panel portion in a position disposing said folded edge proximate to said chuck wall chordally with respect to said groove, said tape in the region of said fold juncture being narrower than said body portion and thereat defining stress-concentrating notches in opposite edges of said tape, and

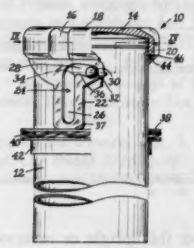
means on said body portion and said lift portion reinforcing said tape in said region.

4,091,958

FILLER CAP ASSEMBLY

Julius Zemke, Voorhees, N.J., assignor to Technical Development Company, Glenolden, Pa.

Filed Sep. 7, 1977, Ser. No. 831,230
Int. Cl.[2] B65D *41/04*
U.S. Cl. 220—291 **3 Claims**



1. A filler cap in combination with a filler neck comprising:

A filler neck being a hollow cylinder, having an annular face perpendicular to the axis of said hollow cylinder and a cylindrical boss mounted below and at a first distance from said annular face at each opposite end of one filler neck diameter,

a ring member mounted exteriorly with respect to said filler neck at a second distance from and below said annular face,

a washer-shaped wavy spring positioned exteriorly with respect to said filler neck and on top of said ring member,

a flat washer positioned exteriorly with respect to said filler neck and on top of said washer-shaped wavy spring,

a filler cap having the shape of a downwardly open, cylindircal cup, a plurality of grip notches formed on its outside, one flat extension formed axially and downwardly from the lateral wall of said filler cap at each opposite end of one filler cap diameter and an internally facing annular groove formed therein,

an "O"-ring lodged, in part, within said annular groove,

a slot formed in each of said flat extensions composed of a straight axial portion for hinging said filler cap rotatably to said cylindrical bosses on said filler neck and of a helically curved top portion causing the engagement between said cylindrical bosses, said extensions and said flat washer biased by said washer-shaped wavy spring for the secure and leakproof locking of said filler cap to said filler neck upon the turning of said filler cap.

4,091,959

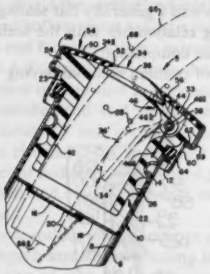
GAS CAP

John D. O'Banion, No. 7 Country Pl., Arlington, Tex. 76010

Filed Feb. 3, 1977, Ser. No. 765,452
Int. Cl.[2] B65D *41/04, 43/16, 51/04*
U.S. Cl. 220—304 **6 Claims**

1. A self closing gas cap removeably secured to a gas filler tube comprising: a cylindrical shaped body having a central passage formed therethrough; a door having a smooth, convex, continuous upper surface; means pivotally securing said door to said body adjacent said passage such that said door is moveable from a first position across the upper end of said central passage to a second position substantially aligned with the wall of said central passage; spring means secured to said body and to said door to urge said door upwardly; a resilient sealing gasket positioned over one end of said body and said door, said gasket having a passage formed centrally therein such that the inner edge of said passage in the gasket engages the upper surface of the door to form a seal therewith and limit upward movement of the door, a portion of the convex upper surface of said door extending through the passage in the gasket; cap means having a passage formed centrally therethrough and

aligned with the passage in the gasket, said passage through the gasket being smaller than the passage through the cap such that the convex upper surface on said door deflects said gasket into



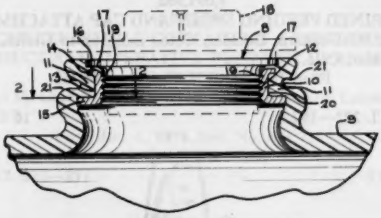
the opening through said cap; means securing said cap means above the gasket and door to secure the gasket to the body to aid the gasket in limiting upward movement of the door.

4,091,960

THREADED BUNGHOLE FOR PLASTIC CONTAINERS

Andrew Joseph Stoll, III, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 4, 1977, Ser. No. 821,599
Int. Cl.[2] B65D *53/00*
U.S. Cl. 220—304 **6 Claims**



1. A bunghole structure for a plastic container for receiving a closure comprising a tubular metal member having an inside cylindrical surface and outside, top, and bottom surfaces; a plastic overlayer integral with the container covering said outside surface and said top surface, the portion of said overlayer covering said top surface defining a seal, said bunghole structure surrounding an opening in the container, and retaining means for releasably holding the closure in said bunghole with said seal clamped between the closure and said metal member.

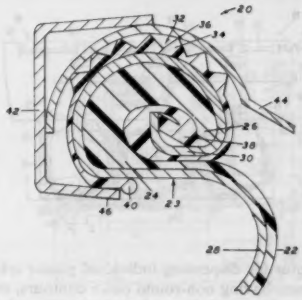
4,091,961

CHIME PROTECTIVE GASKET

Robert A. DuBois, and Rex E. Wagers, both of Marion, Ohio, assignors to Greif Bros. Corporation, Delaware, Ohio

Filed Jun. 21, 1976, Ser. No. 698,114
Int. Cl.[2] B65D *45/32, 53/02*
U.S. Cl. 220—319 **9 Claims**

1. A container comprising: a tubular side wall having an upper end and a bottom end, means closing the bottom end and a top chime construction at the upper end including an inwardly curled bead and a chime strip surrounding the upper end of the container and following the configuration of the bead, the container adapted to receive a cover having a circumferentially extending peripheral edge adapted to conform to the top bead with the cover adapted to be secured across the upper open end of the container by a locking ring assembly, a protective gasket associated with the top chime construction of the container for cooperating in providing a seal between the upper end of the container and the cover, the gasket comprising an annual flexible planar strip in conformation with surfaces of the top chime construction of the container, retention means on the strip in engagement with surfaces of the top chime construction and disposed in the inwardly curled bead to hold the strip in position on the chime, said retention means being in the form of a laterally extending flange extending



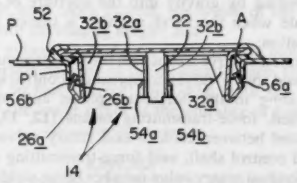
beyond the surface of the strip on both sides thereof, sealing means on the strip for engaging with the cover applied to the container for providing a seal between the container and the cover, and the strip having sufficient flex to extend around the curl to the inside thereof to be engaged by the inner end portion of the chime and held in position and to be stretched over the chime portion surrounding the head of the container and to snap around and under the bead so as to be mounted on the container.

4,091,962

PANEL HOLE CLOSURE

Harold S. van Buren, Jr., Lexington, Mass., assignor to TRW Inc., Cleveland, Ohio

Filed Jul. 20, 1977, Ser. No. 817,461
Int. Cl.[2] B65D *45/16*
U.S. Cl. 220—326 **13 Claims**

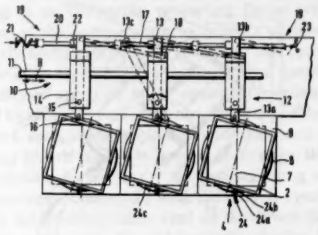


1. A panel hole closure comprising
A. a plate,
B. a plurality of flexible, resilient fingers projecting from one surface of the plate, said fingers being distributed about the center of the plate inboard of its rim,
C. means associated with each finger for stiffening said finger against inward deflection toward the axis of the plate, and
D. a sealing ring extending around the rim of the plate, said sealing ring being made of a plastic material which flows upon being subjected to a selected elevated temperature.

4,091,963
APPARATUS FOR SORTING PLANAR STRUCTURES HAVING NON-ROUND OUTER CONTOURS, SPECIFICALLY SLIDE FRAMES

Johannes Lorsch, An der Bleiche 49, D-4172 Straelen, Germany

Filed Apr. 12, 1976, Ser. No. 675,702
Claims priority, application Germany, Apr. 12, 1975, 2516051
Int. Cl.[2] B65G 59/06
U.S. Cl. 221—264 4 Claims



1. Apparatus for dispensing individual planar articles, such as slide frames, having non-round outer contours, comprising:

a plurality of vertical dispensing chutes (2) each having an inside aperture shaped to receive a stack of said articles;

a discharge chute (9) located below each of said dispensing chutes in axial alignment therewith, said discharge chute having an inside aperture of approximately the same contour as said article, but slightly larger than the latter so as to allow said articles to fall freely through them;

said discharge chute being angularly offset with respect to said dispensing chute so that portions of the discharge chute project into the area enclosed within the inside aperture of the dispensing chute, forming shelves upon which the bottom article of the stack contained within the dispensing chute rests;

singling means (4) arranged between each of said dispensing chutes and its associated discharge chute for dispensing said articles one at a time, said singling means comprising a rotary valve member (8) having an aperture shaped and dimensioned to receive a single one of said articles, said rotary valve member being rotatable between a first position in which its aperture is in registration with the aperture of said dispensing chute, and a second position in registration with the aperture of said discharge chute;

the bottom article of the stack in said dispensing chute descending by gravity into the aperture of said rotary valve member and resting on said shelves when the rotary valve member is in said first position, and said bottom article dropping by gravity into the aperture of said discharge chute when the valve member is turned to said second position;

a common control means (10) for simultaneously rotating all of said rotary valves comprising a control shaft (11) reciprocating in the horizontal plane; and separate spring-loaded, force-transmitting means (12, 13, 14, 17) connected between each of said rotary valve members and said control shaft, said force-transmitting means for any individual rotary valve member being yieldable to prevent excessive turning force being applied to the valve member in the event of a malfunction of that member.

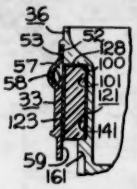
4,091,964
AIR CUTOFF PAD FOR AN AIR PLANTER

Paul H. Harrer, La Porte, Ind., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 508,672, Sep. 23, 1974, Pat. No. 4,074,830. This application Nov. 18, 1976, Ser. No. 743,152
Int. Cl.[2] A01C 7/04
U.S. Cl. 221—266 15 Claims

1. An air cutoff pad for an air planter of the type having a housing with a seed cavity to which bulk seed and pressurized air are supplied and coplanar axial facing sealing surfaces radially spaced from one another by a flat bottom arcuate recess terminating at a seed drop portion at the lower part of the housing and a vertical seed disc with circumferentially spaced seed pockets and a generally flat sealing face in axially abutting and sealing relationship with the sealing surfaces on the housing, said pad comprising:

an arcuate body of resilient material having



radially inner and outer cylindrically shaped peripherial sides,

axially opposite flat sides, and

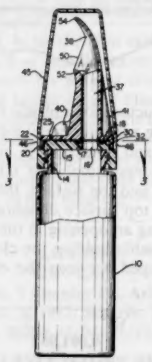
circumferentially opposite ends, said pad being adapted to fit snugly in said recess with one of said flat sides in confronting relation to said sealing face of said disc and

a separate layer of dense plastic bonded on said one flat side adapted for sealing engagement with said sealing face of said disc.

4,091,965
COMBINED FEEDING SPOUT AND CAP ATTACHMENT

Albert W. Gebhard, Boulder, Colo., assignor to Gerico, Inc., Boulder, Colo.

Filed Jun. 22, 1976, Ser. No. 698,358
Int. Cl.[2] B65D 47/26
U.S. Cl. 222—192 16 Claims



1. In apparatus for selectably controlling the discharge of flowable material from an open end of a container comprising:

a cap member adapted to be secured to the open end of the container and having a flat surface on one end thereof with a first rim surrounding said flat surface and with a port through said flat surface, said port being in open communication with the interior of the container,

a cover member mountable on said cap member in close mating relation thereto, said cover member having a flat smooth surface and a second rim surrounding said flat smooth surface, said first and second rims adapted for positive yielding engagement with one another so that said flat surface and said flat smooth surface are maintained in closely spaced parallel relation to one another,

said cover member having an opening through the flat surface of said cover member movable into and out of alignment with the port in said cap member by relative movement of said flat surface and said flat smooth surface, an elongated hollow spout having a pair of open ends with a first said end forming a direct extension from said cover member in a direction away from the container,

mounting means on said first and second rims for retaining said cap member and said cover member in said close mating relation to one another, said mounting means including a circular lip on one of said rims and a channel on the other of said rims, said channel positively receiving said lip when said cover member is mounted on said cap member, and

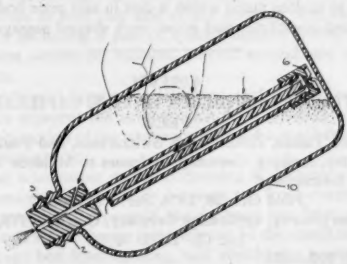
annular resilient sealing means between said flat surface and said flat smooth surface, said sealing means received by a groove in one of said flat surface and said flat smooth surface for retention thereby and biased against the other of said surfaces, said sealing means disposed in surrounding relation to said port and said opening when said opening is aligned with said port, said sealing means cooperating with said lip and said channel to maintain the closely spaced relation of said flat surface and said flat smooth surface.

4,091,966

SQUEEZE BOTTLE CONTAINING A POWDERED PRODUCT AND OPERATIVE WHETHER UPRIGHT OR INVERTED

Robert H. Laauwe, 237 Green Ridge Rd., Franklin Lakes, N.J. 07417

Filed Jun. 1, 1976, Ser. No. 691,710
Int. Cl.[2] B65D *37/00*
U.S. Cl. 222—211 **1 Claim**



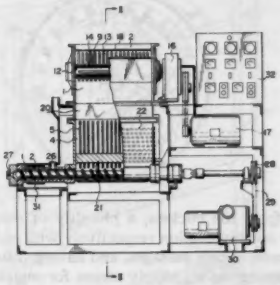
1. A squeeze bottle package adapted for operation either upright or inverted and containing a powdered product and an air space; said bottle having a mouth closed by a nozzle having a dispensing passage; means for forming a U-tube having one upper end connected with said passage, a U-bend adjacent to the bottle's bottom, its other upper end opening into said air space when the bottle is upright, and an orifice in the bottom of the U-bend and open to the product when the bottle is upright; said nozzle having an orifice extending transversely from its said passage and opening into said air space when the bottle is upright and having a smaller flow-rate capacity than that of either the first-named orifice or said open upper end, inversion of the bottle causing the U-tube's said other open end and the second-named orifice to open to the product and the first-named orifice to open to the air space then formed above the product.

4,091,967

DEVICE FOR DEALING WITH THE SCRAPS OF FOAMED THERMOPLASTIC SYNTHETIC RESINS

Tomoo Kinoshita, Tokyo, Japan, assignor to Nihon Repro Machine Kogyo Kabushiki Kaisha, Japan

Filed Jan. 17, 1977, Ser. No. 759,674
Claims priority, application Japan, Apr. 2, 1976, 51-36106
Int. Cl.[2] B29B *1/06*
U.S. Cl. 222—238 **4 Claims**



1. A device for dealing with the scraps of the foamed thermoplastic synthetic resins and the chips and cut ends during the processing of plastics and synthetic resins comprising:

a feeding chamber having a front chamber and a rear chamber, the front chamber having a circular portion and the rear chamber **10** having a circularly shaped portion at the central part thereof, the upper portion of the feeding chamber having a feeding inlet positioned thereat;

a cutting blade fixed on the center line of the feeding chamber at the upper end of the circular portion of the front chamber;

a rotary shaft mounted horizontally on the center line of the circular portion of the front chamber and the circularly shaped portion of the rear chamber;

a plurality of wheel blades fixedly separated on the rotary shaft;

a plurality of stopping materials positioned respectively between the plurality of wheel blades, the lower portions of the plurality of stopping materials being fixed respectively at the lower portion of the rear chamber;

a melting furnace having the shape of a V with respect to both sides thereof fixed at the lower portion of the feeding chamber, and having a plurality of fins mounted vertically to the both inner sides thereof, the width of the fins increasing with decreasing height; and

an extruding cylinder including a screw therein mounted at a lower portion opening of the melting furnace, the upper inner wall surface thereof coinciding with the surface defined by the lower edges of the plurality of fins.

4,091,968

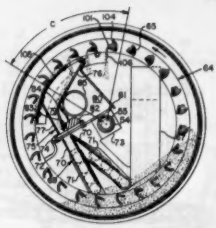
FLUENT MATERIAL DISPENSER AND BUCKET THEREFOR

Tom M. McNaull, LaGrange, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Apr. 29, 1976, Ser. No. 681,307
Int. Cl.[2] G01F *11/10*
U.S. Cl. 222—282 **40 Claims**

10. A fluent material dispensing apparatus comprising a housing for receiving fluent material; a rotor rotatably mounted about a generally horizontal axis within the housing, said rotor having a plurality of axially elongated buckets disposed about the periphery thereof for scooping up the fluent material in the lower portion of the housing, elevating the material, and dumping the material in the upper portion of the housing upon rotation of the rotor, the radial cross-section of

the rotor buckets comprising a flat radially inner wall and an arcuate radially outer wall disposed radially about the leading edge of the inner wall to produce substantially uniform dumping per degree of rotor rotation of the material contained in said cross-section; means for driving the rotor; collector means mounted within said housing and having a plurality of passages having openings positioned to receive a portion of the material



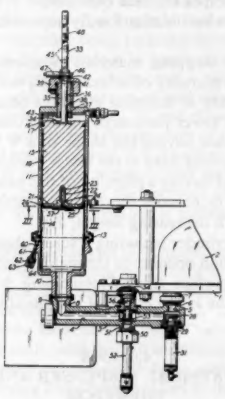
dumped from the buckets; a plurality of discharge tubes in exclusive communication respectively with each of the operative collector means passages, and having distal ends external of the housing; an air supply means for maintaining a higher pressure at the collector means ends of the discharge tubes than at the distal ends for inducing the flow of air and material therethrough.

4,091,969

CONTAINER FILLING MACHINE WITH ADJUSTABLE DISPENSING CYLINDER

William M. Easter; Charles V. Wilhere, and George M. Walker, all of Pittsburgh, Pa., assignors to Horix Manufacturing Company, McKees Rocks, Pa.

Filed Aug. 4, 1976, Ser. No. 711,495
Int. Cl.[2] G01F *11/06*
U.S. Cl. 222—309 **9 Claims**



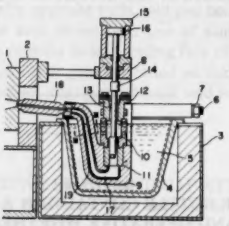
1. In a pressure-fill container filling machine, a vertical dispensing cylinder with an inlet and outlet port in its lower end for liquid product, a cup-shape flexible diaphragm in the lower part of the cylinder, means sealing the edge of the diaphragm to the side of the cylinder, the bottom of the diaphragm being engageable with the bottom of the cylinder around said port to close it, a piston in the cylinder, the piston having an upper portion always engaging the side wall of the cylinder above the diaphragm to center the piston in the cylinder and having a lower portion spaced from the side wall of the cylinder to house the diaphragm during flexing of the diaphragm and filling the cup-shape diaphragm when the piston is in its lowest position, means attaching the lower end of the piston to the bottom wall of the diaphragm, the diaphragm and piston being movable upwardly in the cylinder by liquid product forced up through said port, the upper part of the cylinder being provided with an inlet for air under pressure to move the piston and diaphragm downwardly to expel liquid product from the cylinder through said port, a vertical rod mounted in the top of the cylinder and extending down into it and also above it and having a lower end engageable by the upwardly moving piston, and means for adjusting the rod vertically relative to the cylinder, whereby the distance the piston can rise in the cylinder is adjustable.

4,091,970

PUMP WITH PORUS CERAMIC TUBE

Yoshizo Komiyama, Gotenba; Hiromi Nakamura, Fuji, and Hiroaki Abe, Numazu, all of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed May 11, 1977, Ser. No. 795,723
Claims priority, application Japan, May 20, 1976, 51-58274
Int. Cl.[2] B22D *39/00*
U.S. Cl. 222—596 **13 Claims**



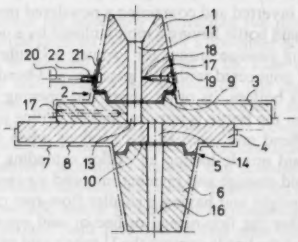
1. In a pump for use in a hot chamber type die casting machine of the type wherein the cylinder of the pump is immersed in molten metal and the molten metal in the cylinder is injected into a metal mould by a plunger operating in the cylinder through a main body constituting a goose neck shaped passage, the improvment which comprises a ceramic tube which is porous to molten metal which is cast in said main body of said pump and constitutes said goose neck shaped passage.

4,091,971

MOLTEN METAL NOZZLE HAVING CAPILLARY GAS FEED

Bernhard Tinnes, Zollikerberg, Switzerland, and Paul-Gerhard Mantey, Amberg, Germany, assignors to Metacon A.G., Zurich, Switzerland

Filed Oct. 28, 1976, Ser. No. 736,367
Claims priority, application Germany, Oct. 31, 1975, 2548854
Int. Cl.[2] B22D *41/08*
U.S. Cl. 222—603 **5 Claims**



1. A firebrick for the use in feeding molten metal, comprising a shaped refractory body having an elongated passage for the

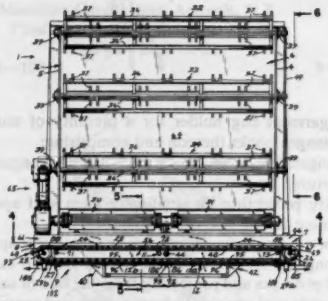
molten metal, and at least one conduit extending from the exterior of said body into communication with said passage for the introduction of gas thereto, a plug located at the inner end of said conduit, said plug having a bore reduced in diameter at least at its inner end adjacent the passage to the size of a capillary.

4,091,972

FORAGE WAGON APPARATUS

Kenneth A. Krueger, Oconomowoc, and Daniel R. Meyer, Barron, both of Wis., assignors to Forage King Industries, Inc., Ridgeland, Wis.

Filed Aug. 18, 1976, Ser. No. 715,392
Int. Cl.[2] A01C *15/18*
U.S. Cl. 222—627 8 Claims



1. Improved forage transport and distribution box apparatus of the type having a stowage box with a front portion and opposed sides, the stowage box containing a front opening for dispensing forage material therethrough from the stowage box, and stowage box conveying means for urging forage material through the stowage box front opening, wherein the improvement comprises:

(a) a lateral feed conveyor for delivering forage material from the stowage box front opening to a dispensing area adjacent at least one side of the stowage box, said conveyor including a pair of spaced support shafts, and an endless conveying member carried around said support shafts;

(b) attachment means for attaching said lateral feed conveyor adjacent the stowage box front opening with the feed direction of the conveyor directed toward the side of the stowage box;

(c) said attachment means containing a delivery opening communicating generally between the front opening and the area directly beneath the stowage box front portion through which forage material may be dispensed from the stowage box front opening, said attachment means rotatably carrying said support shafts such that said endless conveying member is normally positioned over said delivery opening;

(d) a delivery surface associated with said lateral feed conveyor for supporting forage material thereon during its delivery by said endless conveying member, said delivery surface being normally positioned over said delivery opening;

(e) delivery surface support means for removably supporting said delivery surface over said delivery opening to allow said delivery surface to be selectively removed; and

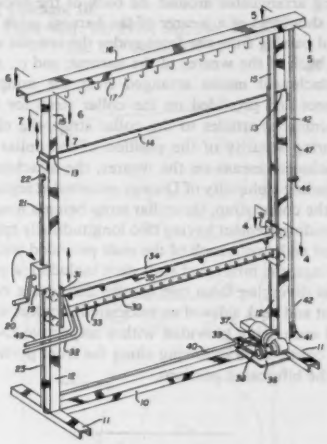
(f) means for removably mounting said endless conveying member around said support shafts to allow said endless conveying member to be selectively removed, whereby forage material may be dispensed from the front opening through the delivery opening when said delivery surface and said endless conveying member are removed.

4,091,973

DRAPERY PLEATER STEAMER

Harry Crothers, and Sidney R. Lockley, both of New Castle, Pa., assignors to Harry Crothers, New Castle, Pa.

Filed May 19, 1977, Ser. No. 798,645
Int. Cl.[2] A41H *43/00*
U.S. Cl. 223—28 5 Claims



1. A drapery pleater steamer comprising a vertically standing frame and a secondary vertical frame movable vertically relative thereto, horizontally disposed apertured steam and vacuum pipes and means supporting the same arranged for vertical movement relative to said vertical frame, steam and vacuum supply sources, hoses connecting said steam and vacuum supply pipes with said sources and secondary means for moving said steam and vacuum pipes and their support means vertically relative to said vertical frames and a drapery supported thereby.

4,091,974

MULTI-USE CAMERA HARNESS

Wayne E. McClintock, Box 848, El Paso, Tex. 79945

Filed Oct. 18, 1976, Ser. No. 733,518
Int. Cl.[2] A45F *5/00*
U.S. Cl. 224—5 V 3 Claims

1. A multi-use camera harness adapted for being arrangeable around the neck and the shoulders of a wearer of the harness comprising, in combination:

(a) an elastic band provided with a pair of ends and with

fastener means for connecting together the ends of the band;

(b) a collar strap provided with a plurality of slots forming means for retainingly engaging the elastic band, the latter being threaded through the slots and being arrangeable for passing behind the back of a wearer of the harness for retaining the collar strap on the wearer, the collar strap being arrangeable around the back of the neck and over the shoulders of a wearer of the harness, with the elastic band passing from the front under the armpits and behind the back of the wearer of the harness; and

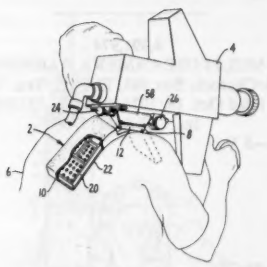
(c) attachment means arranged over the armpits of the wearer and provided on the collar strap for permitting fastening of articles to the collar strap, the elastic band assuring security of the position of the collar strap and attachment means on the wearer, the attachment means including a plurality of D-rings mounted at separate points on the collar strap, the collar strap being a longitudinally extending element having two longitudinally spaced bifurcated ends, with each of the ends provided with a pair of D-rings, the bifurcated ends each including a pair of portions diverging from one another for laying on opposite front and back sides of an associated shoulder of a wearer and each being provided with a respective D-ring, with the elastic band following along the front portion of each of the bifurcated portions.

4,091,975

ANTHROPOMORPHIC SHOULDER MOUNT

Jerry C. Russell, Jr., Redwood City, Calif., assignor to International Video Corporation, Sunnyvale, Calif.

Filed May 4, 1976, Ser. No. 683,088
Int. Cl.² A45F 5/00
U.S. Cl. 224—5 V **4 Claims**



1. An anthropomorphic mount for supporting a camera type device on the shoulder of an operator comprising:

an articulated saddle, having a center support and forward and rearward shoulder pads pivotally fixed to said center support with portions of said shoulder pads extending into said center support, for resting on the shoulder of said operator;

camera type device supporting means mounted on said articulated saddle; and

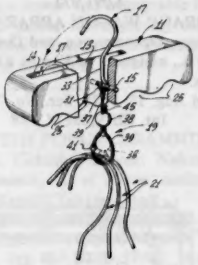
means for adjusting the contour of said saddle to the shoulder of said operator with said contour adjusting means including linkage means linking said portions for providing simultaneous inward and outward rotation of said shoulder pads relative to the shoulder of said operator and means adjustable by said operator for driving said linkage means to adjust the inward and outward rotation of said shoulder pads.

4,091,976

GARMENT BAG HOLDER

Clarence Wesley Morse, 5598 Naples Canal, Long Beach, Calif. 90803

Filed Mar. 23, 1977, Ser. No. 780,262
Int. Cl.² B65D 69/00
U.S. Cl. 224—45 R **6 Claims**



1. A garment bag holder for a plurality of coat hangers having hanger hooks thereon and comprising:

an elongated rigid handle formed with an elongated central aperture;

a cavity projecting longitudinally from said aperture and opening to one side of said handle;

a pivot pin projecting transversely across said aperture;

an elongated flexible cord connected on one extremity to said pivot pin and projecting from the side of said aperture opposite said one side to form a shank and centrally turned back on itself to dispose the free extremity thereof adjacent and coextensive with said shank;

slip means connecting said free extremity of said cord and shank together to form a closed loop defining a slip noose for receipt of the hanger hooks; and

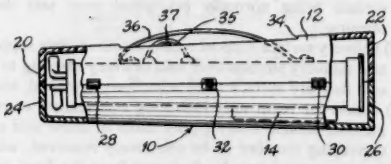
a rigid suspension hook device formed on one end with a turned back hook and on its opposite extremity with a shank terminating in an eye connected to said pivot pin and sized for pivoting about said pivot pin from a position recessed in said cavity projecting longitudinally of said handle to an operative position projecting from said handle to said side opposite said one side whereby a traveler may recess said hook device in said handle, place said holder in his pocket for storage and, when desirable, remove said holder from his pocket and hook said hangers into said noose and grasp said handle to carry garments on said hanger to their dstination and, if desirable, pivot said suspension hook out of said cavity to its operative position to hang said holder from a support.

4,091,977

PROTECTIVE ENCLOSURE

Michael B. Luttbeg, 764 Winding Bend La., Manchester, Mo. 63011

Filed Feb. 6, 1976, Ser. No. 655,987
Int. Cl.² B65D 71/00
U.S. Cl. 224—47 **8 Claims**



1. A protective carrier for shipping and enclosing a golf bag

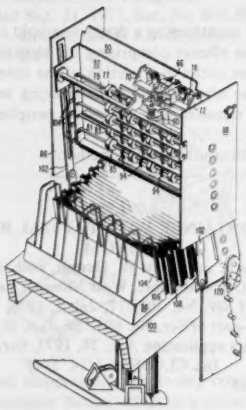
and clubs comprising a rigid molded container having cooperating sections, the closed container having a substantially circular cross-section and being of substantially conical shape, the closed container having an interior space for receiving a golf bag and clubs therein, at least one section of the container having a longitudinal slot therein to receive a carrying element of an enclosed golf bag therethrough, the carrier having cooperating means to retain a carrying element through the slot, the slot having reinforcing means adjacent to the slot, the carrier having a plurality of longitudinally extending reinforcing ribs spaced circumferentially on the carrier to provide increased rigidity and strength to the carrier, the carrier having fastening means for selectively connecting the cooperating sections.

4,091,978

SHEET HANDLING APPARATUS

John Earl Graham, II, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 8, 1976, Ser. No. 739,396
Int. Cl.² B26F *3/02*
U.S. Cl. 225—100 **9 Claims**



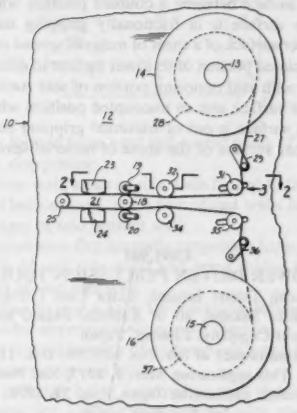
1. A universal job separation and distribution system for sheets separated from a continuous form web comprising:
- selectively actuable bursting means for separating sheets from a continuous form web;
- means for producing a signal corresponding to the sheet length in the web;
- first selectively actuable feeding means for feeding the burst sheets straight ahead along the sheet path at a predetermined velocity;
- second selectively actuable feeding means for feeding the burst sheets laterally as they move along the sheet path while maintaining the predetermined velocity along the sheet path;
- control means responsive to the sheet length signal for providing a first control signal denoting the relative time for initiation of a bursting operation, a second control signal denoting the relative time for energization of said second feeding means, and a third control signal denoting the duration of said energization;
- means under control of said first control signal to selectively actuate the bursting means and said first feeding means at the relative time defined by said signal;
- means under control of said second control signal to selectively actuate said second feeding means and selectively deactuate said first feeding means at a relative time defined by said second control signal to initiate an offset operation; and
- means for de-energizing said second feeding means and to energize said first feeding means in response to said third control signal to produce a predetermined offset to provide lateral separation of sheets into different groups.

4,091,979

METHODS AND APPARATUS FOR PRECISION GUIDING A WEB

Lewis B. Browder, Altadena, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Mar. 29, 1976, Ser. No. 671,534
Int. Cl.² B65H *17/32*
U.S. Cl. 226—7 **37 Claims**



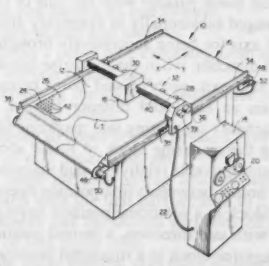
1. A method of precision guiding a web, comprising in combination the steps of:
- moving said web;
- providing a guide for said moving web having a web guiding surface;
- pivoting said guide for movement about a pivot axis extending through said web guiding surface and being laterally spaced from a longitudinal axis of symmetry of said web for twisting said moving web about an axis extending in a direction of movement of said web to provide a yaw force acting continuously in a predetermined direction transversely of said web; and
- resisting said yaw force at a predetermined location.

4,091,980

APPARATUS FOR ADVANCING SHEET MATERIAL

Heinz Joseph Gerber, West Hartford, Conn., assignor to Gerber Scientific Instrument Company, South Windsor, Conn.

Filed May 16, 1977, Ser. No. 797,000
Int. Cl.² B65H *17/36*
U.S. Cl. 226—162 **8 Claims**



1. In an automatically controlled instrument system having a carriage for controlling precise movement of an instrument

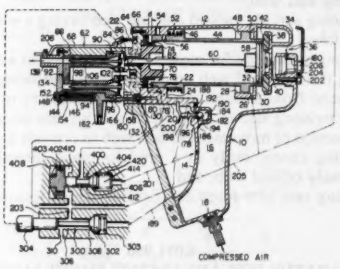
over a table on which a sheet of material is spread and including means for releasably coupling the sheet of material to the carriage for movement therewith and relative to the table to alter the position of the sheet of material on the table, the improvement comprising said table having a stationary low-friction work surface for supporting a sheet of material spread thereon and said coupling means including at least one frictional coupling unit mounted on said carriage for movement therewith relative to said stationary low-friction surface, said one frictional coupling unit including a friction shoe having a high-friction surface and means for moving said friction shoe generally toward and away from an opposing portion of said low-friction surface between a coupled position wherein said high friction surface is in frictionally gripping engagement with the upper surface of a sheet of material spread on the table with an associated portion of its lower surface in direct contact engagement with said opposing portion of said stationary low friction work surface and an uncoupled position wherein said high friction surface is out of frictional gripping engagement with the upper surface of the sheet of material spread on the table.

4,091,981

POWER DRIVEN PERCUSSION TOOL

Seki Moriguchi; Tatsuo Innami; Akira Uno; Hiroki Orikasa, and Toshihito Sakaba, all of Katsuta, Japan, assignors to Hitachi Koki Company, Limited, Japan

Continuation-in-part of Ser. No. 639,766, Dec. 11, 1975, abandoned. This application Mar. 3, 1977, Ser. No. 774,119
Claims priority, application Japan, Aug. 21, 1975, 50-101588
Int. Cl.[2] B25C *1/04*
U.S. Cl. 227—8 **19 Claims**



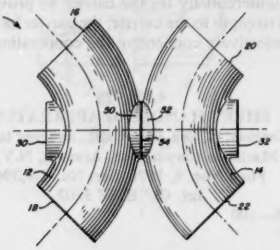
1. A percussion tool for driving an elongated fastener, comprising reciprocating drive means for striking an elongated fastener at one end thereof in a forward direction when actuated, a generally cylindrical magazine block rotatable about an axis substantially parallel with said direction and having a plurality of axial bores parallel with the axis of the magazine block and arranged substantially in symmetry about and with respect to said axis for being successively brought into alignment with said direction when the magazine block is stepwise rotated about said axis, each of said bores being adapted to releasably retain an elongated fastener therein, a magazine holder for detachably supporting said magazine block thereon while allowing the magazine block to rotate about said axis, and a manipulator movable relative to said magazine block and said magazine holder between a first position operative to hold the magazine block in a rotational position having one of said bores aligned with said direction, a second position operative to hold the magazine block in a rotational position having one of said bores misaligned with said direction and a third position allowing the magazine block to be detached from said magazine holder.

4,091,982

METHOD OF CONSTRUCTING A DOUBLE-SIGMOID CONNECTOR

John Leonard Carberry, Memphis, Ind., assignor to Chemetron Corporation, Chicago, Ill.

Continuation of Ser. No. 679,337, Apr. 22, 1976, abandoned. This application Aug. 1, 1977, Ser. No. 820,463
Int. Cl.[2] F16B *2/00*
U.S. Cl. 228—173 F **5 Claims**



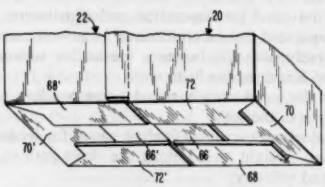
1. A method constructing a double-sigmoid connector from a pair of arcuate elbows comprising the steps of:
(a) forming an outlet in a portion of the outer periphery of each of the elbows, said outlet having an annular wall extending outwardly of the outer periphery of each elbow; and
(b) welding the outlet walls together.

4,091,983

BULK CONTAINER WITH PARTIAL BELLOWS BOTTOM

Vernard S. Booth, and Billy W. Oswalt, both of Albany, Ga., assignors to Olinkraft, Inc., West Monroe, La.

Division of Ser. No. 701,577, Jul. 1, 1976, which is a continuation-in-part of Ser. No. 694,756, Jun. 10, 1976, Pat. No. 4,046,307. This application Apr. 28, 1977, Ser. No. 791,713
Int. Cl.[2] B65D *3/24, 5/48*
U.S. Cl. 229—15 **7 Claims**



1. A bottom for a bulk container having at least one cell with four side walls circumscribing the one cell, the bottom comprising
three bottom panels hinged at horizontal score lines on the bottom edges of three of the four walls forming an end bottom panel and two side bottom panels on opposite sides of the end bottom panels,
the two side bottom panels of said three bottom panels being hinged to the opposite sides of the end bottom panel of said three bottom panels by vertical score lines,
said two side bottom panels having respective partial diagonal score lines extending at one end from the respective corners defined by the vertical and horizontal score lines,
said two side bottom panels further having respective cuts extending from the distal edges of the side bottom panels to the other ends of the partial diagonal score lines such as to form partial bellows corners at the bottom end of the bulk container,

a fourth bottom panel hinged on the bottom edge of the fourth side wall and free of the three bottom panels,

said fourth bottom panel being sandwiched between the end bottom panel and fold-in portions defined by the partial diagonal score lines and cuts with the end bottom panel on top of the fourth bottom panel as the container sits upright, and

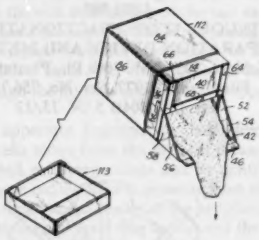
said end bottom panel and said fourth bottom panel each extending more than one half but substantially less than all the distance across the bottom whereby together the end bottom panel and fourth bottom panel cover the bottom.

4,091,984

SIFT-PROOF, SHIPPING AND DISPENSING CONTAINER

William W. McFarland, Wooster, Ohio, assignor to International Paper Company, New York, N.Y.

Filed Sep. 21, 1977, Ser. No. 835,382
Int. Cl.[2] B65D *13/00, 5/72*
U.S. Cl. 229—23 BT **8 Claims**



1. A sift-proof, shipping and dispensing container comprising an inner container fabricated from a unitary blank and a separate outer container fabricated from a unitary blank,

said inner container comprising:

(a) a bottom wall;

(b) first, second, third and fourth side walls hingedly connected to said bottom wall along score lines;

(c) pairs of primary gusset panels hingedly connecting the side edges of the first and second, second and third, third and fourth, and fourth and first side walls, said primary gusset panels and said side walls being of equal height, and said primary gusset panels overlying the outer surfaces of said second and fourth side walls when the container is in erected condition;

(d) top walls hingedly connected to said first and third side walls along transverse score lines parallel to the score lines connecting said first and third side walls to said bottom wall;

(e) tuck-in flaps hingedly connected to said top walls along transverse score lines;

(f) pairs of secondary gusset panels hingedly connecting the top edges of the primary gusset panels which are connected to said first and third side walls to the side edges of said top walls;

said outer container comprising:

(g) four side walls;

(h) end walls hingedly connected to opposite end edges of each of said side walls to form top and bottom walls; and

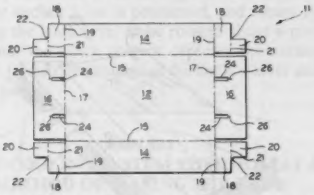
(i) a tear strip encircling the upper end of said outer container to permit separation thereof into cover and body sections.

4,091,985

SELF-LOCKING TRAY

Jay J. Holzinger, Bethlehem, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed Nov. 10, 1977, Ser. No. 850,423
Int. Cl.[2] B65D *5/26*
U.S. Cl. 229—35 **1 Claim**



1. A tray formed from a cut and scored blank of paperboard, or the like, comprising:

(a) a bottom wall, a pair of side walls hinged to the side edges of said bottom wall, and a pair of end walls hinged to the end edges of said bottom wall;

(b) an end closure flap hingedly projecting from an end edge of each of said side walls and being folded to overlap a portion of said end wall;

(c) said flap having a lock tab integrally formed therewith and folded approximately normal thereto;

(d) a slot formed in each of said end walls and having a slit extension cut in said wall;

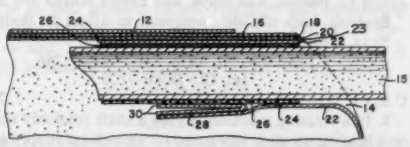
(e) said lock tab being received in said slot and said slit extension for locking engagement with said end wall thereby securing said walls of said tray together, wherein said slit extension is cut in said end wall immediately above said slot and centrally thereof.

4,091,986

CONTAINER HAVING IMPROVED FILLING VALVE

Robert T. Eberle, Monroe, La., assignor to Olinkraft, Inc., West Monroe, La.

Filed May 4, 1977, Ser. No. 793,721
Int. Cl.[2] B65D *31/14*
U.S. Cl. 229—62.5 **7 Claims**



1. An industrial container comprising

a multiwall bag having an end closure,

a filling entry in said end closure,

means defining a paper tube extending from said entry to an interior portion of said bag,

a sleeve extending through said paper tube and adapted to receive a filling nozzle,

means securing an upper portion of said sleeve to an adjacent portion of said paper tube, and

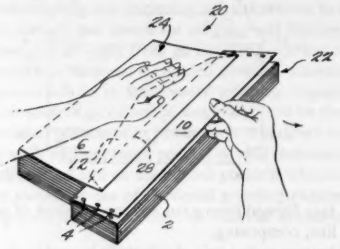
a flexible hinge element having first and second superimposed parts with the first part secured to a lower portion of said sleeve and the second part secured to an adjacent portion of said paper tube,

said flexible hinge element providing additional support for said sleeve whereby said sleeve is secured from tearing during a nozzle filling operation which increases the weight of material in the bag.

4,091,987
CARRIER SHEET BUSINESS FORM ASSEMBLY

Clendon W. Cone, Glens Falls, N.Y., assignor to Web Graphics, Inc., Glens Falls, N.Y.

Filed Sep. 24, 1976, Ser. No. 726,475
Int. Cl.[2] B65D *27/10*
U.S. Cl. 229—69 22 Claims



1. An improved carrier sheet and envelope assembly comprising a continuous carrier sheet having a plurality of transversely extending longitudinally spaced-apart weakened lines, said weakened lines serving to divide said carrier sheet into a plurality of transversely extending sections, each of said sections having a length defined by the spacing between adjacent ones of said weakened lines, a plurality of envelopes each of said envelopes having a sealing flap in a closed, folded condition, means for detachably securing said envelopes to a lower portion of alternating ones of said carrier sheet segments so that only about one half of the closed flap is positioned on said segment with the remaining portion of the flap extending away from said segment thereby allowing the carrier sheet to be folded in a zig-zag fashion thereby positioning the envelopes in an aligned, stacked condition with each envelope positioned directly beneath the envelpe thereabove with each envelope having its front face being adjacent the rear face of the envelope thereabove whereby the remaining portion of the flap is positioned outwardly of the stack of folded segments and about one half of the width of the stack of folded segments extends outwardly from the stack of envelopes.

4,091,988
CENTRIFUGAL TRAP FOR SOLID PARTICLES

Albert G. Bodine, Van Nuys, and Ernest Alfred von Seggern, Burbank, both of Calif., assignors to Albert G. Bodine, Van Nuys, Calif.

Filed Jun. 21, 1976, Ser. No. 698,286
Int. Cl.[2] B04B *1/00*
U.S. Cl. 233—1 R 7 Claims

1. In a rotating machine having a shaft rotatably supported on a bearing which is lubricated by an ambient supply of water, the improvement being a centrifugal filter unit mounted in external concentricity with said shaft for filtering out solid particles from said water, comprising:

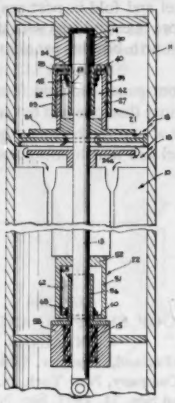
a rotatable cylindrical member mounted in external concentricity with said shaft,

said rotatable cylindrical member being coupled to said shaft for rotation therewith,

a fixed cylindrical member mounted between said rotatable member and said shaft in external concentricity with said shaft and internal concentricity with said rotatable member,

an annular chamber axially related to said shaft being formed between said cylindrical members and an annular channel axially related to said shaft being formed between said fixed cylindrical member and said shaft, water being supplied to said bearing through said channel, said chamber having an inlet on one end thereof and an outlet in communication with said channel on the opposite end thereof,

whereby when said rotatable member is rotatably driven said particles are centrifugally driven outwardly against the inner walls of said chamber, thereby cleansing of said

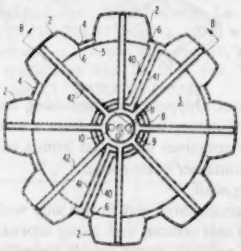


particles the water supplied through said channel to said bearing.

4,091,989
CONTINUOUS FLOW FRACTIONATION AND SEPARATION DEVICE AND METHOD

Charles A. Schlutz, 7081 NW. 10th Pl., Plantation, Fla. 33313

Filed Jan. 4, 1977, Ser. No. 756,724
Int. Cl.[2] B04B *5/04, 15/12*
U.S. Cl. 233—14 R 76 Claims



1. A centrifuge apparatus for separating red bood cells from a suspending liquid comprising:

(1) enclosure means for enclosing liquid suspended red blood cells;

(2) rotation means for rotating the enclosure means about the vertical axis thereof;

(3) injector means for moving the liquid suspended blood cells into and the separated blood cells out of the enclosure means;

(4) seal means for sealing the injector means to the enclosure means in a liquid-tight relationship;

(5) plurality of red blood cell receiving means in fluid communication with each other and spaced about the longitudinal periphery of the enclosure means and forming part of the enclosure means; wherein each of the red blood cell receiving means has an entry duct means for passing liquid suspended blood cells into the red blood cell receiving means and an exit duct means for passing from the red blood cell receiving means suspending liquid which has been at least partially depleted of red blood cells, the exit duct means of each red blood cell receiving means being in fluid communication with the entry duct means of the next succeeding red blood cell receiving means; and

wherein the entry and exit duct means are of a vertical cross-sectional area which is small compared with the vertical cross-sectional area of the red blood cell receiving means and the peripheral extremity of the red blood cell receiving means lies on a peripheral diameter of the enclosure means which is larger than the peripheral diameters of the enclosure means on which the peripheral extremities of the entry and exit duct means lie;

(6) an intake passage means in fluid communication with the injector means for passing liquid suspended red blood cells from the injector means into the entry duct of a first red blood cell receiving means;

(7) a discharge passage means in fluid communication with the injector means for passing suspending liquid from the exit duct means of the last red blood cell receiving means to the injector means;

(8) a plurality of independent conduit means, reach with one end thereof in fluid communication with the said injector means and the other end thereof disposed in the red blood cell receiving means;

(9) power means for rotating the rotation means and enclosure means to a speed of angular rotation sufficient to separate the red blood cells from the suspending liquid and compact the red blood cells in the red blood cell receiving means;

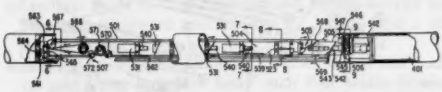
(10) control means for controlling the flow of liquid suspended blood cells through the injector means, intake passage means and entry duct of the first red blood cell receiving means; for controlling the flow of suspending liquid from the exit duct means of the last red blood cell receiving means through the discharge passage means and through the injector; and for controlling the flow of separated red blood cells from the red blood cell receiving means through the injector and out of the apparatus injector;

whereby the apparatus functions so that liquid suspended red blood cells move from the injector means to the first red blood cell receiving means and by centrifugal force the more dense red blood cells separate from the less dense suspending liquid and compact at the peripheral extremity of the red blood cell receiving means and the suspending liquid trans-elutriated via the exit duct means of the first red blood cell receiving means and the entry duct means of the next succeeding red blood cell receiving means into the next succeeding red blood cell receiving means, and whereby said function is repeated with each succeeding red blood cell receiving means and essentially total separation of the red blood cells from the suspending liquid is accomplished.

4,091,990
SELF-CONTAINED INSTRUMENT FOR MEASURING SUBTERRANEAN TUNNEL WALL DEFLECTION

Donald Edgar Rasmussen, Kennewick, and Peter John Hof, Jr., Richland, both of Wash., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Division of Ser. No. 585,223, Jun. 9, 1975, Pat. No. 3,987,667. This application Aug. 2, 1976, Ser. No. 710,518
Int. Cl.² G06K *1/05*
U.S. Cl. 234—115 **4 Claims**

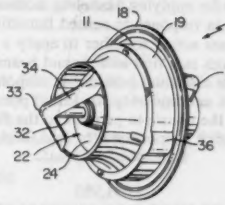


1. A punch paper tape recorder comprising a plurality of punches, a die plate, a gap through which the tape passes being formed between the punches and die plate, means for selectively urging said die plate toward the paper tape and the punches, and means for selectively restraining movement of certain of said punches relative to the movement of the paper tape and the die plate while enabling others of said punches to be moved in response to the movement of the die plate, said punches and die plate being activated so that the restrained punches cause holes to be punched into the paper tape in response to movement of the die plate, and wherein said means for restraining movement of selected punches includes for each punch a rotatable anchor lever having a face bearing against a face of the punch remote from the gap, a latch lever for the anchor lever, said latch lever having a notch against which a corner of the anchor lever is positioned, and means for selectively urging the latch lever to be rotated about a pivot point thereof so that the notch thereof captures the corner of the anchor lever to restrain rotation of the anchor lever and movement of the punch.

4,091,991
ENGINE COOLING SYSTEM THERMOSTAT AND METHOD OF MAKING THE SAME

Boyd P. Sliger, Concord, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed May 21, 1976, Ser. No. 688,751
Int. Cl.² F01P *7/02*
U.S. Cl. 236—34.5 **12 Claims**



1. In a vehicle type thermostat having a housing means provided with a valve seat that is controlled by a movable valve member which is interconnected to a temperature responsive device that is carried by said housing means, said thermostat having leak means to provide a leak path for air being displaced by coolant being added to said cooling system, the improvement wherein said housing means has positioning means thereon for rotationally orienting said housing means in a vehicle engine cooling system whereby said thermostat can be disposed in the desired rotational position in said cooling system, said leak means comprising two diametrically disposed leak paths in said housing means whereby said positioning means assures that one of said leak paths will be disposed near the top of said housing means when said housing means is positioned by said positioning means in said cooling system.

4,091,992
PNEUMATIC PRESSURE TRANSMITTER RESPONSIVE TO TEMPERATURE AND HUMIDITY

Ernest H. Stark, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed Apr. 25, 1977, Ser. No. 790,372
Int. Cl.² G05D *22/00*
U.S. Cl. 236—44 C **19 Claims**

1. A force-balance pneumatic pressure transmitter responsive to temperature and humidity comprising:

a nozzle;

an inlet for conducting a restricted supply of fluid under pressure to said nozzle;

a flapper operatively associated with said nozzle to vary fluid flow through the nozzle;

a first pivot displaced from said nozzle;

a first elongated resilient simple beam supported at one end upon said first pivot and connected at the other end to said flapper;

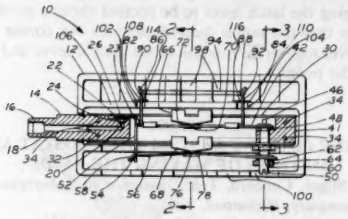
a first abutment associated with said first beam and located

between said nozzle and said first pivot biasing said flapper toward said nozzle through said first beam;

a second pivot displaced from said nozzle;

a second elongated resilient simple beam supported at one end upon said second pivot and connected at its other end to said flapper;

a second abutment associated with said second beam and located between said nozzle and said second pivot biasing said flapper toward said nozzle through said second beam;



first means for applying a bending moment to one of said beams in response to sensed temperature;

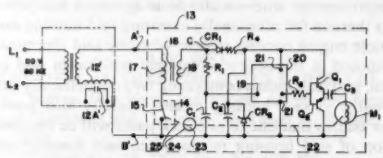
second means for applying a bending moment to the other of said beams in response to sensed humidity, said first and second means acting together to apply a variable control force through said first and second beams to said flapper to modulate said fluid pressure in response to the sensed temperature and humidity, said fluid pressure acting over the area of the nozzle to provide to the flapper a negative feedback force proportional to said fluid pressure.

4,091,993

TIME VARIABLE THERMOSTAT

William A. Knecht, Hartford, and Chester J. Zajac, Litchfield, both of Conn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Jun. 9, 1976, Ser. No. 694,272
Int. Cl.[2] F23N *5/20*
U.S. Cl. 236—46 R **4 Claims**



1. In a time variable thermostatic device adapted for connection without additional wiring into a two-wire control circuit of a heating or cooling system that includes a starting relay for operating said heating or cooling system when actuated the improvement comprising:

thermostatic control means including a thermostatic switch having at least two temperature set points, said switch closing when said ambient temperature varies a determined amount from either of said selected set points;

electrical timer means including a stepper motor for periodically changing the temperature set point of said thermostatic control means to and from said two respective values at determined intervals; and

circuit means including a transformer having inductively coupled primary and secondary windings interconnecting said timer means, said thermostatic control means, and said starting relay in said two-wire control circuit and providing a continuous alternating current in said secondary winding in either position of said thermostatic switch, said starting relay being actuated only with said thermostatic switch in said electrical timer means closed;

frequency responsive means connected to said secondary winding for generating a series of output voltage pulses, the rate of pulse generation being a submultiple of the frequency of said continuous alternating current; and

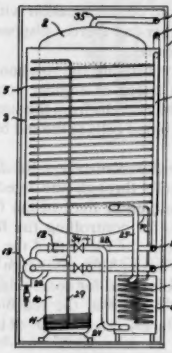
means for applying said output voltage pulses to said stepper motor whereby said timer means is sychronized with the frequency of said continuous alternating current.

4,091,994

HEAT PUMP DEVICE

Henning Brinch Madsen, Greve Strand, Denmark, assignor to Svenska Geotherm Aktiebolag, Karlstad, Sweden

Filed Mar. 4, 1976, Ser. No. 664,027
Claims priority, application Denmark, Mar. 10, 1975, 949/75
Int. Cl.[2] G05D *23/00*; F25B *27/02*
U.S. Cl. 237—2 B **3 Claims**



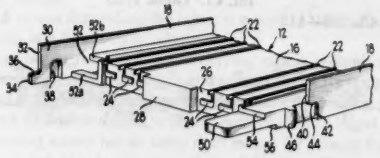
1. Heating device for simultaneous heating of water for heating radiators and hot consumption water comprising a heat pump, including a compressor, a vaporizer, a condenser and a thermostatic expansion valve connected in a closed circuit; a hot water receptacle for the hot consumption water and having inlet and outlet means for said consumption water; a cover surrounding the hot water receptacle and forming therewith a surrounding separate space wherein said condenser is disposed; means including a supply conduit and a return conduit for passing the radiator water through said space; a by-pass conduit from the supply circuit to the return conduit outside the cover; and control means for passing an adjustable amount of radiator water through said by-pass conduit.

4,091,995

TOY VEHICLE TRACK

Gordon A. Barlow, Evanston; Derek A. Brand, Naperville, and Alex Imatt, Chicago, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Aug. 23, 1976, Ser. No. 716,674
Int. Cl.[2] E01B *23/00*; A63H *19/28*
U.S. Cl. 238—10 A **6 Claims**



1. A trackway for toy vehicles including a plurality of elongated track sections, each section having two end faces, an upper surface defining a roadbed for said toy vehicles along the top of said trackway, and complementary engageable connection means for releasably maintaining the track sections

in abutment with one another, said connection means comprising:

a generally vertical, flexible, longitudinally extending tab protruding from the end face of said track section and positioned on one side of said track section, said tab including a depression on one side thereof and outwardly of said end face;

detent means on the opposite side of said track section inwardly of said end face for engaging and flexing the flexible tab outwardly and seating within said depression of an adjacent track section automatically in response to longitudinal movement of said track section and abutment of said end faces to secure the track sections against inadvertent longitudinal separation;

a recess formed in the end face of the track section adjacent one side thereof; and

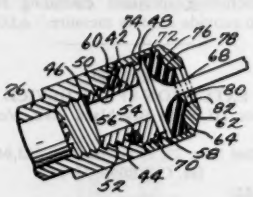
a complementary longitudinally extending tab protruding from the end face of said track section for insertion into the recess of an adjacent track section to prevent the adjacent track sections from being canted relative to one another about a transverse axis.

4,091,996

SPRINKLER IRRIGATION SYSTEM AND APPARATUS FOR DIRECTING A STREAM OF WATER INTO THE ATMOSPHERE

Barton R. Nelson, Walla Walla, Wash., assignor to Nelson Irrigation Corporation, Walla Walla, Wash.

Filed Jul. 12, 1976, Ser. No. 704,676
Int. Cl.² B05B *1/32*
U.S. Cl. 239—177 **13 Claims**



1. An agricultural irrigation sprinkler system for distributing a source of water under pressure above a predetermined minimum pressure onto a horizontal surface of an agricultural field which may vary in vertical height comprising a multiplicity of sprinkler heads adapted to operate in different positions within said field, conduit means operatively connected with said sprinkler heads for communicating a source of water under pressure with said sprinkler heads, the improvement in combination therewith which comprises at least one of said sprinkler heads comprising:

a water sprinkler body having an inlet adapted to be communicated with the source of water under pressure and an outlet in flow communicating relation with said inlet,

means fixedly connected with said conduit means for the water under pressure for mounting said sprinkler body for movement with respect to said conduit means through repetitive cycles of movement,

an annular member of resilient material having interior surface means, spaced exterior surface means, and a discharge orifice defining opening therebetween,

means for mounting said annular member within said outlet of said water sprinkler body such that water flowing through said inlet in communication with the interior surface means of said resilient annular member will deform said resilient annular member an amount proportional to the amount such water pressure is in excess of said predetermined minimum pressure and by such deformation reduce the size of said opening an amount proportional to said deformation so that the water flowing through said opening out of fluid pressure communicating relation with the exterior surface means of said resilient annular member is defined as a stream entering the atmosphere with a cross-sectional size and velocity which vary inversely with respect to each other such that a substantially constant amount of water per unit time is contained in the aforesaid stream entering the atmosphere throughout the aforesaid range of pressure variation in the source,

means carried by said sprinkler body operable in response to the flow of water under pressure from said conduit means through said resilient annular member opening for effecting a repetitive cyclical movement of said sprinkler body so as to cause the stream issuing from said resilient annular member opening to be distributed onto an area greater than the area onto which the stream is distributed at any one time,

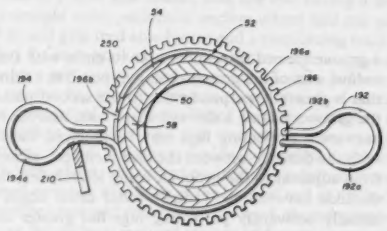
said mounting means including a rigid annular wall fixed with respect to said sprinkler body and disposed in spaced relation outwardly in the direction of flow to the portion of said resilient annular member defining said opening when there is no water under pressure in communication with said resilient annular member, said rigid annular wall having interior annular surface means positioned to be engaged by outward deformation of said resilient annular member when the latter is communicated with water under pressure as aforesaid.

4,091,997

ROTARY SPRINKLER ARC ADJUSTMENT

H. Curtis Ridgway, Dallas, Tex., assignor to Telsco Industries, Inc., Dallas, Tex.

Filed Jan. 17, 1977, Ser. No. 759,728
Int. Cl.² B05B *3/08*
U.S. Cl. 239—206 **14 Claims**



1. Arc adjustment apparatus for a rotary sprinkler having a rotatable nozzle supported from a shaft and a reversing mechanism attached to the nozzle comprising:

a notched circumferential surface on the shaft, and

first and second locking collars each having a band portion encircling and compressively engaging the shaft adjacent said circumferential surface to restrict said collars from moving longitudinally from said circumferential surface, and an extension extending from the band portion of each locking collar for selective engagement with the notches of said circumferential surface.

4,091,998

RETAINER CLAMP

Samuel F. Peterson, Chicago, Ill., assignor to Associated Mills, Inc., Chicago, Ill.

Filed Nov. 16, 1976, Ser. No. 742,377
Int. Cl.² B05B *15/06*
U.S. Cl. 239—283 **10 Claims**

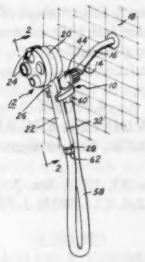
1. An improved retainer clamp and showerhead assembly for selectively and securely supporting a handheld showerhead wherein the handheld showerhead includes a nozzle portion and a handle portion which is connected at one end to the nozzle portion and which has a pair of opposed, radially out-

wardly projecting lugs that are formed on one part of the handle portion, between its one end and its distal end, and that are disposed in a first plane also including the longitudinal central axis of the handle portion, wherein the handheld showerhead is adapted to be connected with a source of water under pressure such as it conventionally found in the bathrooms or the like, and wherein the handheld showerhead may be supported by the retainer clamp while water is being sprayed therefrom and when the handheld showerhead is not in use, an improved retainer clamp comprising:

a main supporting bracket that includes a first, fixture portion and a second, clamping portion;

the first fixture portion of the main supporting bracket including means for mounting the main supporting bracket in the bathroom or the like;

the second clamping portion of the main supporting bracket including two curved, generally "U" shaped arm members which are spaced from one another such that the one part of the handle portion may be disposed between the arm members and which have their central longitudinal axes disposed in a second plane, each arm member having



a groove formed therein between its ends, with the longitudinal axes of the grooves being disposed in a third plane that is generally perpendicular to the second plane, with the grooves having a size and shape such that the radially outwardly projecting lugs may be received therein and with the distance between the arm members, as measured from adjacent to the grooves, being slightly less than the distance between the radially outer distal edges of the radially outwardly projecting lugs but greater than the cross-sectional dimension of the handle portion, as measured in the first plane and from adjacent to the bases of the radially outwardly projecting lugs, so that when the outwardly projecting lugs are disposed within the grooves, relative angular movement, about the longitudinal axis of the handle portion, between the handle portion and the second portion of the main supporting bracket is restricted; and

means for limiting axial movement of the handle portion, with respect to the second portion of the main supporting bracket, in one direction when the radially outwardly projecting lugs are disposed within the grooves.

4,091,999

DUAL PURPOSE BLOW GUN NOZZLE

Frank J. Voos, Stratford, Conn., assignor to National Distillers and Chemical Corp., New York, N.Y.

Filed Sep. 17, 1976, Ser. No. 723,855
Int. Cl.² B05B *15/00*
U.S. Cl. 239—289 **2 Claims**

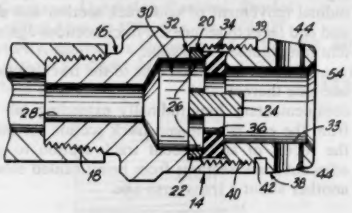
1. A nozzle adapted to attach to a blow gun so as to convert the blow gun to dual purpose utility, comprising:

a tubular body having an end face and further including a bore extending axially from one end to the other end of said body;

a depressor within said bore, and means in the form of a shoulder formed in the bore for restraining axial movement of said depressor;

said depressor including a pin extending axially and of such length as to engage a pin on a tire valve when such valve is inserted into the other end of said body;

said depressor further including a disc integrally formed with said pin, and at least one opening in said disc for permitting air to flow substantially unrestrictedly from the one end of said tubular body to the other;



threads at said one end of the tubular body for engagement with corresponding threads in said blow gun so that said nozzle will have its longitudinal axis coincide with the longitudinal axis of the blow gun;

a sealing washer fitting against said depressor;

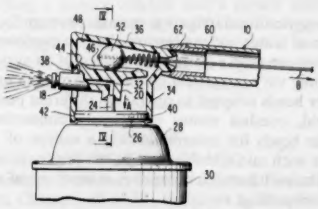
a retainer ring abutting said sealing washer, said retainer ring having a first portion threadedly engaged with the other end of said body, adjacent said end face, and a second portion extending axially beyond said end face said second portion including apertures extending radially therethrough to provide a safety measure.

4,092,000

EXTENSION SPRAY DEVICE

Harry C. Offutt, III, 969A Beachland Blvd., Vero Beach, Fla. 32960

Filed Nov. 22, 1976, Ser. No. 743,947
Int. Cl.² B05B *15/06*
U.S. Cl. 239—532 **9 Claims**



1. An extension spray device for remotely supporting and operating a conventional aerosol can having a crimped-cap closure with a moveable tubular control valve stem extending centrally out from said closure which comprises:

a spray member comprising a body portion

a nozzle extending laterally therefrom,

a dished coupling depending from said body portion, and

an L-shaped bore in the body portion joining said nozzle to said coupling;

can holding means comprising:

a cylindrical member,

a transverse web portion at one end of the cylindrical member,

the opposite end thereof having gripper means to grip the crimped-cap closure of an aerosol can,

a lateral opening in said cylindrical member, and

a hinge adjacent said lateral opening connecting said spray member body portion to said cylindrical member holding

said nozzle in position to discharge through said lateral opening,

valve stem actuation means comprising:

a groove in the surface of said spray member body portion opposite to said dished coupling, the distance between the base of said groove and the undersurface of said transverse web portion of said can holding means progressively decreasing rearwardly of said nozzle,

a wedge member positioned in said groove and engaging said undersurface,

spring means biasing said wedge member toward said nozzle, and

a line fastened to said wedge member by which it may be pulled along said groove away from said nozzle;

a tubular extension having first and second ends connected at its first end to said can holding means, said actuating means line extending along said extension member internally thereof,

a handle attached to the second end of said extension member, and

lever means carried by said handle connected to said line to enable said wedge member to be moved by movement of said lever means.

4,092,001

FUEL INJECTION NOZZLE FOR INTERNAL COMBUSTION ENGINES

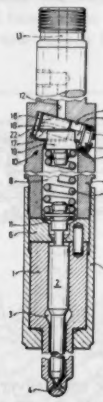
Karl Hofmann, Neckarrems, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Nov. 29, 1976, Ser. No. 745,718

Claims priority, application Germany, Dec. 6, 1975, 2554987

Int. Cl.[2] B05B *1/30*

U.S. Cl. 239—533.6 **7 Claims**



1. In a fuel injection nozzle for an internal combustion engine, including: a needle valve; means defining a valve seat; a spring plate; a spring engageable at one end with the needle valve and at the other end with the spring plate, said spring providing a biasing force serving to bias the needle valve into engagement with the valve seat; and housing means defining a longitudinally extending bore within which the needle valve, valve seat defining means, spring plate and spring are located, the improvement comprising:

a bore extending generally transversely into said housing and defining an open end; and

adjustment means mounted in the generally transversely extending bore and retained therein through the engagement of said adjustment means with said spring plate and by the biasing force of said spring, said adjustment means being accessible through said open end for adjusting the bias force of said spring.

4,092,002

DRIP FEED ATTACHMENT TO FEED TUBES

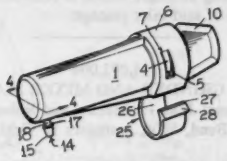
Barry J. Grosse, Fairview Park, and Johann J. Morley, Norwood, both of Australia, assignors to Iplex Plastic Industries Pty. Ltd., Elizabeth, Australia

Filed Aug. 10, 1976, Ser. No. 713,099

Claims priority, application Australia, Oct. 17, 1975, 3617/75

Int. Cl.[2] B05B *15/00*

U.S. Cl. 239—542 **3 Claims**



1. A drip feed attachment to feed tubes comprising a hollow body having within it a removable flow control member engaged in the said body from an open end shaped to form between said flow control member and said body an elongated flow path for water characterized by a combination of a hollow nipple and a resilient hook shaped holding member for placing said feed tube attachment into communication with said elongated flow path and holding said feed tube attachment to said feed tube, said hollow nipple projecting from the said drip feed attachment and communicating with the said elongated flow path, said resilient hook shaped holding member being positioned on the said drip feed attachment to lock said nipple in said aperture when engaged on said feed tube, one end of the said hook shaped member being an integral continuation of said drip feed attachment, said one end having a substantially straight outer peripheral section where said one end connects to said grip feed attachment and a reenforcing section is provided for such hook shaped member on an inner portion thereof where said straight outer peripheral section is located and said reenforcing section connects to said drip feed attachment, the free end of said hook shaped member extending an arcuate length in excess of 180° and terminating near an adjacent portion of said body to provide a restricted opening through which a feed tube can be positioned by distorting said hook shaped member, said body at the integral end of the hook shaped member and said free end of the hook shaped member both having flat surfaces inclined toward said opening to guide a feed tube into and through the opening between the free end of the hook shaped member and the adjacent portion of the said body.

4,092,003

SPRAY NOZZLE

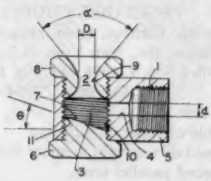
Hiroshi Ikeuchi, 507-7-2 Hiratacho, Ashiyashi, Hyogo, Japan

Continuation of Ser. No. 645,958, Jan. 2, 1976, abandoned. This application Mar. 10, 1977, Ser. No. 776,368

Claims priority, application Japan, Aug. 14, 1975, 50-99391

Int. Cl.[2] B05B *1/02*

U.S. Cl. 239—590 **1 Claim**



1. A spray nozzle having a casing forming inlet and outlet

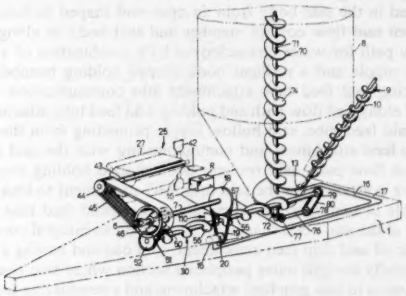
passages having intersecting axes at right angles to each other, said casing forming a connecting chamber between said passages, a ramp formed in said connecting chamber having a surface which rises downstream from and relative to said inlet passage, said inlet passage having a narrowed throat section relative to and adjacent said connecting chamber, said throat section having an axis generally coincident with the main axis of said inlet passage, said outlet passage having a narrowed throat section relative to said connecting chamber followed by a flaring section to form a fully conically shaped spray pattern, said ramp forming an angle which is between 10 and 30° relative to the axis of said inlet passage.

4,092,004

FEED GRINDER AND MIXER MACHINE

John H. Leverenz; John H. Mocho, and Robert E. Ambroziak, all of West Bend, Wis., assignors to Gehl Company, West Bend, Wis.

Filed May 9, 1977, Ser. No. 794,730
Int. Cl.[2] B02C *23/28*
U.S. Cl. 241—56 **9 Claims**



1. A feed grinder and mixer apparatus comprising, a main frame, a hammermill having an inlet and a discharge side and mounted on said frame and for receiving and grinding feed, a mixing tank mounted on the frame, a mixing auger rotatably mounted in said mixing tank, a generally horizontal and longitudinally disposed feed screw auger means communicating with and for receiving ground material from said hammermill; said feed screw auger means including a central power shaft, screw flights secured to said shaft and a casing in which said power shaft and flights are rotatably driven, power means for rotating said power shaft and said flights secured thereto, whereby ground material from said hammermill is delivered by said screw auger means to said mixing tank, and a power drive connection between said power shaft of said screw auger means and said mixing auger whereby the latter is driven by said power shaft, said power drive connection including, a lay shaft journalled in said frame, constant mesh bevel gears on said mixing auger and on said lay shaft, sprockets connected to said lay shaft and said power shaft, and an endless chain drivingly connecting said sprockets.

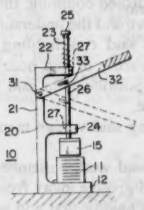
4,092,005

VEGETABLE CHOPPER

Emory E. Benroth, Bluffton, Ohio, assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Sep. 9, 1976, Ser. No. 721,678
Int. Cl.[2] B02C *18/04*
U.S. Cl. 241—168 **1 Claim**

1. A vegetable chopper, comprising
a frame formed of a upright member fixed to a base and to a pair of spaced parallel arms,
a rod slidably mounted to said parallel arms and extending beyond both arms,
a knife blade fixed to one end of the said rod,
a lever pivotably mounted to said upright member of the frame,
said lever linked by slotted means to said rod,



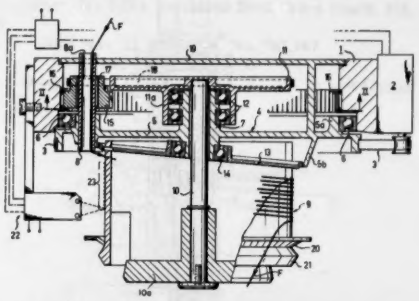
said slotted means comprising a curved slot in the lever, in which slot extends a pin fixed to the said rod, so that pivotal travel of the lever causes said rod to travel in non-uniform relation to the travel of the lever.

4,092,006

THREAD STORAGE AND DELIVERY DEVICE

Kurt Arne Gunnar Jacobsson, Ulricehamn, Sweden, assignor to Aktiebolaget IRO, Ulricehamn, Sweden

Filed Dec. 1, 1976, Ser. No. 746,374
Claims priority, application Germany, Dec. 1, 1975, 2553935
Int. Cl.[2] B65H *51/20*
U.S. Cl. 242—47.01 **22 Claims**



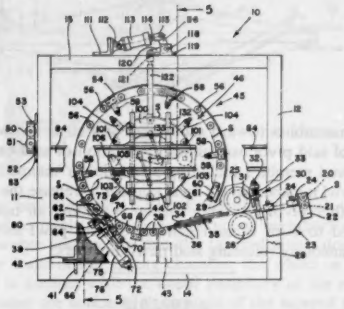
1. In a thread storage and delivery device for textile machines, including a housing, a rotatably driven thread supply device rotatably supported on the housing and defining a thread channel, a rotatably supported drum axle, a storage drum mounted on the drum axle, and a gearing means drivingly coupling the storage drum to the thread supply device in such a manner that the storage drum stands still with respect to the housing as the thread supply device is rotatably driven, said gearing means including at least one driven wheel rotatably supported on and carried by said thread supply device and an annular path fixed with respect to said housing, said driven wheel being engaged with said path and rollingly movable therealong in response to rotation of said thread supply device, comprising the improvement wherein the gearing means drivingly engages and rotates the drum axle which is fixedly connected to the storage drum and is rotatably supported on the thread supply device, and the thread channel being arranged at a radial distance from the drum axis and extending substantially rectilinearly.

4,092,007

STRIP ACCUMULATOR

Robert G. Weatherby, Northfield, and Anthony C. Costello, Strongsville, both of Ohio, assignors to Kent Corporation, North Royalton, Ohio

Filed May 23, 1977, Ser. No. 799,438
Int. Cl.[2] B65H 17/48
U.S. Cl. 242—55 20 Claims



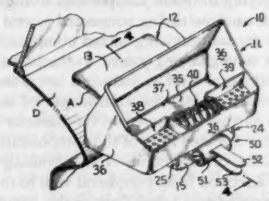
1. Apparatus for accumulating strip material comprising a frame support, means forming an outer set of convolutions of the strip material, and means forming an inner set of convolutions of the strip material, said means forming said outer set of convolutions including flexible band means defining the outer convolutions, roller means mounted on said band means to contact the first outer convolution of the strip material, and means supporting said band means on said frame support to permit expansion of said band means, the expansion having a radial component along substantially the entire length of said band means.

4,092,008

CAR SMOKERS SAFETY TRAY

Paul Edward Fetter, R.D. 1 Penn Dr. Box 394, Selinsgrove, Pa. 17870

Filed Sep. 28, 1976, Ser. No. 727,443
Int. Cl.[2] B60R 11/00
U.S. Cl. 248—205 A 9 Claims



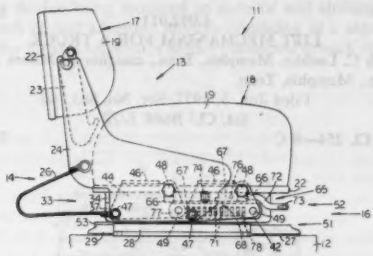
1. An ash tray particularly adapted for utilization on the dashboard of a vehicle comprising a base and a tray, said tray including a bottom wall and an upstanding peripheral wall collectively defining a chamber adapted to receive ashes and like debris, said base having first and second end portions, means for securing said first end portion to a vehicle dashboard with said second end portion projecting therefrom and forming a seat for said tray, cooperative means carried by said second end portion and bottom wall for slidably assembling and disassembling said base and tray, said tray having a forward projection overlying a forward edge of said second end portion, and clamp means at the forward edge of said second end portion for releasably securing said projection to said second end portion in the assembled condition of said ash tray.

4,092,009

HEIGHT ADJUSTER FOR A VEHICLE SEAT

L. John Koutsky, Milan, Ill., assignor to Sears Manufacturing Company, Davenport, Iowa

Filed Mar. 16, 1977, Ser. No. 778,018
Int. Cl.[2] A47C 1/02
U.S. Cl. 248—421 8 Claims



1. A height adjuster for vehicle seats, the vehicle seat having a support assembly, affixed to the vehicle, and a seat assembly, said height adjuster comprising:

support means for connecting the support assembly and the seat assembly, said support means being pivotally attached both to the support assembly and to the seat assembly;

upwardly biasing torsion means for urging said support means to pivot upwardly from the support assembly thereby increasing the distance between the vehicle and the seat assembly, said upwardly biasing torsion means being affixed between the support assembly and said support means; and

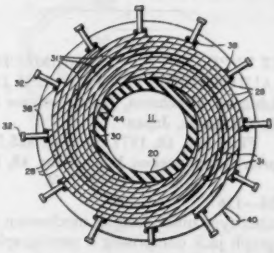
locking means including a linking member and a latching member, said linking member being attached to, and movable with, said support means, the longitudinal axis of, and movements of, said linking member being substantially in a horizontal plane, said linking member having a plurality of of slots formed therethrough, said latching member being affixed to the support assembly and being movable to engage and hold said linking member against movement, whereby said support means is locked against movement thereby securing the seat assembly at a selected distance from the vehicle.

4,092,010

VARIABLE FLUID PASSAGE

William L. Carlson, Jr., St. Cloud, Minn., assignor to General Signal Corporation, Rochester, N.Y.

Filed Oct. 12, 1976, Ser. No. 731,149
Int. Cl.[2] F16K 7/06
U.S. Cl. 251—4 25 Claims



1. A device comprising:

means for defining a fluid passage, said means including an inlet section, a throat section, and an outlet section, said

fluid passage decreasing in size in said inlet section and increasing in size in said outlet section,

a plurality of sheet-like flexible members extending axially along substantially the entire length of said fluid passage and extending radially outwardly in a spiral configuration from said means for defining a fluid passage, and

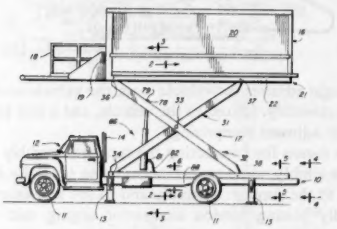
means for adjusting the radial position of said flexible members to vary the size of said fluid passage.

4,092,011

LIFT MECHANISM FOR A TRUCK

Ralph C. Luebke, Memphis, Tenn., assignor to Moore & Sons, Inc., Memphis, Tenn.

Filed Jun. 3, 1977, Ser. No. 803,166
Int. Cl.² B66F *3/22*
U.S. Cl. 254—8 C **7 Claims**



1. A lift mechanism for a truck including front and rear axles, a truck frame mounted on said axles, and a vertically movable frame above said truck frame and generally over said rear axle, said mechanism comprising a longitudinally extending channel member secured to said truck frame on each side thereof, two arms pivotally connected at a center pivot at approximately their centers to form a scissors configuration, one end of one arm having a fixed pivotal connection with said truck frame and said channel members and the other end having a movable connection with said vertically movable frame, one end of the other of said arms having a fixed pivotal connection with said vertically movable frame and a movable connection with said truck frame and said channel members, an extensible power unit connected between said arms for spreading or closing said arms and thereby raising or lowering said movable frame relative to said truck frame, said power unit being connected to said arms at locations between said center pivot and said fixed pivotal connections, and longitudinally extending structural reinforcement means secured to said truck frame on each side thereof and extending from approximately said rear axle rearwardly to approximately the rearward end of said truck frame, said channel members being secured to said reinforcement means and said reinforcement means being shaped to strengthen said channel members and said truck frame against downward flexing, whereby said movable connection with said truck frame is supported by said channel members, by said reinforcement means, and by said truck frame.

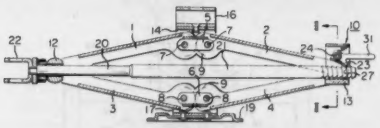
4,092,012

RATCHET TYPE QUICK FEEDING MECHANISM FOR AUTOMOBILE PANTOGRAPH JACK

Hiroyuki Ishigami, Yokohama, Japan, assignor to Otsuka Koki Co., Ltd., Yokohama, Japan

Filed Aug. 18, 1977, Ser. No. 825,766
Claims priority, application Japan, Mar. 18, 1977, 52-1977
Int. Cl.² B66F *3/08*
U.S. Cl. 254—126 **2 Claims**

1. A ratchet type quick feeding mechanism for an automobile pantograph jack comprising a pantograph link assembly adjustable in height by relative horizontal movement of a pair of pivot assemblies disposed in diagonally opposite corners of said link assembly; a rotatable bar having a ratchet screw thread portion, said bar being disposed in fixed axial position in one of said pivot assemblies with the ratchet screw thread portion extending through the other of said pivot assemblies; a plurality of pawl members disposed on said other pivot assembly at axially symmetrical positions with respect to said bar, each of said pawl members engaging said ratchet screw thread portion of said bar, said pawl members and said ratchet screw thread portion cooperating to enable sliding movement of said



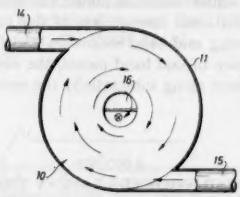
pivot assemblies toward each other as well as screw advancement of said pivot assemblies by rotation of said bar; each of said pawl members including a handle for manually rotating said pawl members away from said bar to release the same; and said other pivot assembly further including an operator bar coupled to both of said handles of said pawl members for simultaneously releasing said pawl members.

4,092,013

MIXER WITH NO MOVING PARTS

Gustaf Adolf Staaf, Navigatorgatan 6, Vasteras, Sweden

Filed Aug. 6, 1975, Ser. No. 602,249
Claims priority, application Sweden, Jul. 9, 1975, 7411581
Int. Cl.² B01F *5/00*
U.S. Cl. 366—165 **10 Claims**



1. A mixing device comprising a housing defined by a surface of revolution having a central axis with a peripheral wall concentric with said axis, and two axially spaced generally radial gables, at least two inlet tubings connected with said housing for supplying different components to the housing to be mixed, a single outflow tubing connected to said housing at said central axis for withdrawing mixed components, at least one of said inlet tubings being joined to the housing tangentially to said peripheral wall to induce a spiral inwardly directed flow in said housing, the axial length of said housing being relatively narrow compared to its diameter to confine the spiral inwardly directed flow of the components to a radial direction, the axial cross-section of the housing becoming narrower in the direction from peripheral wall to the axis so as to increase the rate of said spiral flow as the components approach the outflow tubing, said outflow tubing being provided with a flow obstruction comprising a hindering plate in a position transverse to the circumferential component of rotational motion of the outflowing medium.

4,092,014

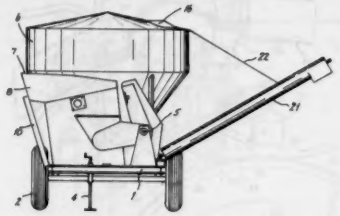
FEED MIXER

William Felix Hughes, Belmont, Australia, assignor to Hughes Steel Products Pty. Ltd., Belmont, Australia

Filed Oct. 13, 1976, Ser. No. 732,102
Int. Cl.² B01F *7/00*
U.S. Cl. 366—156 **8 Claims**

1. A mixer comprising a substantially conical mixing chamber supported vertically with its apex lowermost, means for

feeding material into the mixing chamber, a tapered auger situated in the mixing chamber, drive means provided at the base of the mixing chamber, the narrowmost end of the tapered auger connected to the drive means such that the auger rotates around its own axis and its upper end rolls around the upper periphery of the mixing chamber, the upper end of the tapered



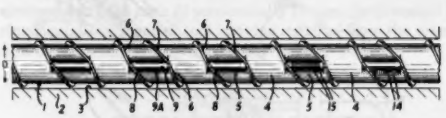
auger being provided with a wheel or roller to allow the tapered auger to freely roll around the upper periphery of the mixing chamber and ensure that the tapered auger does not contact the walls of the mixing chamber, the wheel or roller being held in contact with the upper periphery of the mixing chamber under the action of the weight of the tapered auger, and means for discharging material from the mixing chamber.

4,092,015

EXTRUDER SCREW

Klaus Koch, Gleidingen, Germany, assignor to Paul Troester Maschinenfabrik, Hanover, Germany

Filed Sep. 20, 1976, Ser. No. 724,941
Claims priority, application Germany, Sep. 24, 1975, 2542515
Int. Cl.[2] A21C *1/06*
U.S. Cl. 366—81 **9 Claims**



1. An extruder for the working of plastic material and rubber comprising an extruding cylinder and an extruding screw rotating in the cylinder, said screw having a core and helical webs on said core with screw channels between said webs and having along its length several zones with different numbers of webs, said screw having in at least one part of its length a plurality of single thread zones alternating with a plurality of two-thread zones, each of said two-thread zones having two screw channels and two webs extending parallel to the axis of said screw across said screw channels respectively and having wedge-shaped flanks so that a wedge-shaped aperture is formed between the cylinder wall and the wedge-shaped flanks of said axially extending webs, one helical web of each two-thread zone joining the helical web of the preceding single thread zone and the other helical web of said two-thread zone joining the helical web of the following single thread zone where the axially extending webs meet the helical webs of the two-thread zone.

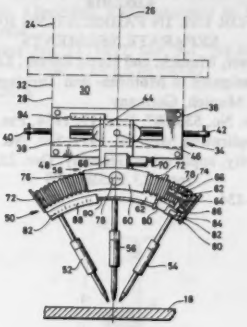
4,092,016

ADJUSTABLE CUTTING TORCH MACHINE

Georg Roeder, Frankfurt am Main, Germany, assignor to Messer Griesheim GmbH, Frankfurt am Main, Germany

Filed Jan. 20, 1976, Ser. No. 650,712
Claims priority, application Germany, Mar. 1, 1975, 2509060
Int. Cl.[2] B23K *7/10*
U.S. Cl. 266—77 **20 Claims**

1. In a cutting torch machine with at least one support arranged displaceably on a transverse track on which a multiple torch aggregate is provided with the torches of the aggregate being adjustable relative to each other, characterized in that said support is rotatable about its vertical axis, a first horizontal shifting device mounted on the lower end of said support, a second horizontal shifting device mounted on said lower end of said support diametrically opposite said first horizontal shifting device with said horizontal shifting devices thereby being mounted on opposite sides of said support to provide a counterbalanced mounting with respect to said support, an adjusting device being mounted to each of said shifting devices, each of said adjusting devices consisting of a segment and a drive for said segment, a holder connected to each of said



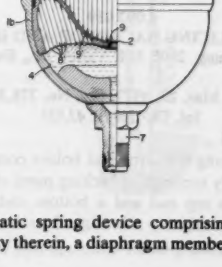
adjustable devices, said segment being mounted to said holder and being movable in a guiding element for carrying its cutting torch, said drive being arranged on said guiding element and being connected with said segment, said segment being curved like a circular arc, the segment portions projecting on both sides from the guiding element being mounted in a bellows housing, on the side of the segment remote from said drive there being provided a guide housing shifting means, and each cutting torch being mounted to its said shifting means for movement thereby whereby each cutting torch has its angular position changed in accordance with the adjustment of its said adjusting device.

4,092,017

PNEUMATIC SPRING DEVICE

Goro Urushiyama, Ooi, and Noriyuki Takahashi, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 3, 1977, Ser. No. 803,286
Claims priority, application Japan, Jun. 10, 1976, 51-68006
Int. Cl.[2] F16F *9/08*
U.S. Cl. 267—65 B **3 Claims**



1. A pneumatic spring device comprising a rigid casing defining a cavity therein, a diaphragm member arranged in said

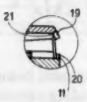
casing to divide said cavity into two fluid chambers, including a gaseous-fluid chamber having a mass of gaseous spring medium sealed therein and an oil chamber to be held under oil pressure load, said diaphragm member being formed normally to bulge into said oil chamber, and a multitude of projections of elastic material formed in dense clusters on both surfaces of said diaphragm member so as to be compressed against each other thereby to resist displacement of said diaphragm member only when the latter is displaced from a predetermined neutral position into said oil chamber.

4,092,018

FIXTURE FOR USE IN FABRICATING RINGS FROM SEPARATE SEGMENTS

Werner Schlosser, Munich, and Horst Berger, Lochham, both of Germany, assignors to Motoren- und Turbinen Union Munchen GmbH, Munich, Germany

Division of Ser. No. 533,587, Dec. 17, 1974, Pat. No. 4,034,182. This application Mar. 28, 1977, Ser. No. 781,909
Claims priority, application Germany, Dec. 21, 1973, 2363722
Int. Cl.[2] B25B *1/08*
U.S. Cl. 269—234 **6 Claims**



1. A fixture for holding together separate segments in a ring shape while the segments are being welded together by an electron beam to form a unitary ring, comprising:

(a) a base plate,

(b) a plurality of jaw elements arranged in a circle on said base plate, each of said jaw elements being slidable radially with respect to said base plate,

(c) a locating rim near the radially outer end of each jaw element against which the segments can abut,

(d) an upstanding leg near the radially inner end of each jaw element, said leg having a slide surface,

(e) a clamping ring above said upstanding legs and slidable toward said base plate, said clamping ring having a tapered inner peripheral surface cooperable with said leg slide surfaces for urging said jaw elements radially inwardly, and

(f) a cover plate above said clamping ring and slidable toward said base plate, said cover plate having a tapered inner peripheral surface cooperable with the segments for urging the segments radially inwardly,

whereby the segments are clamped together in a ring shape.

4,092,019

CABLE SPLICING BACKDROP AND HOLDER

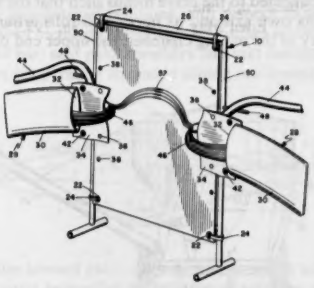
Donald Leroy Young, 2805 Hill Valley Dr., Escondido, Calif. 92025

Filed Mar. 17, 1977, Ser. No. 778,360
Int. Cl.[2] H01R *43/00*
U.S. Cl. 269—296 **10 Claims**

1. A cable splicing backdrop and holder comprising:

a large generally rectangular backing panel of flexible material having a top end and a bottom end and fastening means adjacent the top side edges for attaching said panel to supporting structure,

loop means at each side of said panel for receiving and supporting the ends of opposed cables to be spliced, and



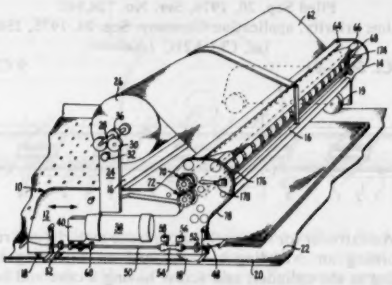
first and second pocket means for receiving the ends of said cables.

4,092,020

SHADEMARKER

Hubert Blessing, Dallas, Tex., assignor to Levi Strauss & Co., San Francisco, Calif.

Filed Dec. 15, 1976, Ser. No. 750,806
Int. Cl.[2] B65H *29/46*
U.S. Cl. 270—31 **8 Claims**



1. An improved shademarker apparatus for printing on a web of fabric as the fabric is spread by a fabric spreading machine, the shademarker being mounted on the fabric spreading machine and having at least one inked, rotatable printing cylinder having raised characters and an opposed impression cylinder, with the fabric web being imprinted with selected characters across its width from the printing cylinder as the fabric web is fed between the printing cylinder and the impression cylinder during spreading of the fabric web wherein the improvement comprises:

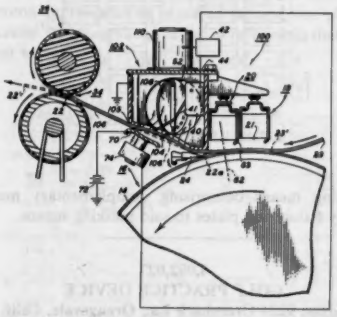
means for equalizing tension along the longitudinal edges of the fabric web including

raised pads on the circumferential surface of the impression cylinder said fabric web passing about a portion of said impression cylinder so as to engage at least two of said pads whereby tension along the longitudinal edges of the fabric web is equalized when portions of the fabric web which are slack drape between the raised pads and portions of the fabric web which are taut span between circumferentially adjacent raised pads each of the raised pads being positioned to mate with a least one corresponding raised character on the printing cylinder, and means for synchronizing the rotation at the printing cylinder with the rotation of the impression cylinder.

4,092,021
UNFUSED IMAGE TRANSPORT

Gerald M. Fletcher, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 2, 1977, Ser. No. 792,950
Int. Cl.² B65H 29/54
U.S. Cl. 271—176 14 Claims

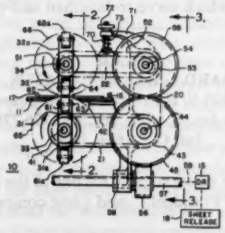


1. In an electrostatographic copier in which a copy member bearing an unfused and electrically disturbable image of imaging material on one side thereof is transported on a conductive vacuum guide member which vacuum engages the opposite side of said copy member and then removed from said conductive guide member at a removal area of said guide member, the improvement wherein a conductive electrostatic baffle means is electrically connected and sufficiently closely spaced from said guide member to provide a low electrostatic field zone between said baffle means and said guide member for the movement therebetween of the copy member, and wherein said removal area of said guide member is within said low electrostatic field zone to substantially reduce the potential for electrical disturbance of said imaging material from the separation of said copy member from said guide member.

4,092,022
SIDE-REGISTERING DEVICE

Friedrich Preuss, Sprendlingen, and Kurt Difflipp, Dietzenbach, both of Germany, assignors to Roland Offsetmaschinenfabrik Faber & Schleicher AG., Germany

Filed May 27, 1977, Ser. No. 801,312
Claims priority, application Germany, May 29, 1976, 2624170
Int. Cl.² B65H 9/00
U.S. Cl. 271—236 18 Claims

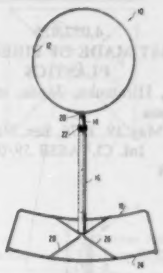


1. In a device for the lateral and longitudinal positioning of sheets on the feed table of a sheet-fed printing press, the combination comprising front stops cyclically interposeable at the front of the table, a side guide at the lateral edge of the table, a lower laterally movable wiper member under the sheet in the vicinity of the side guide, an upper laterally moveable wiper member in a cooperating position above the sheet, driving means timed with the arrival of a sheet for imparting wiping movement to the wiper members from a mutually sheet-engaging position spaced from the side guide to a mutually sheet-releasing position adjacent the side guide, the wiping members having respective friction shoes for engagement of the presented lower and upper surfaces of the sheet, the friction shoes being in the form of rollers freely rotatable about axes which extend in the direction of wiping movement so that the sheet may move against the front stops, with accommodating rotation of the rollers, at the same time that the sheet is being wiped by the rollers toward the side guide.

4,092,023
SPORT TRAINING DEVICE

Mary C. Hazen, Cleveland, Ohio, assignor to Roe-Mar, Inc., Cleveland, Ohio

Filed Jan. 11, 1977, Ser. No. 758,494
Int. Cl.² A63B 69/40
U.S. Cl. 273—26 A 3 Claims



1. A sport training device for improving the accuracy of a thrown or kicked object comprising;

a. a target loop through which the object is thrown or kicked;

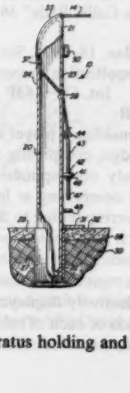
b. a support attached to said target loop said support being adjustable so as to vary the vertical height of said target loop; and

c. a curved, rocking base attached to said support, said base oriented to allow the target loop and support to oscillate in a plane generally transverse to the path of travel of the thrown or kicked object.

4,092,024
SUPPORT POST FOR GAME NET

Richard L. Hoover, Phoenix, Ariz., assignor to Net Posts Inc., Phoenix, Ariz.

Filed May 17, 1976, Ser. No. 686,706
Int. Cl.² A63B 61/00
U.S. Cl. 273—29 BF 5 Claims



1. A support post apparatus holding and supporting a game

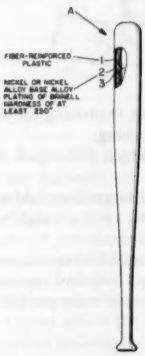
net above the surface of a game court, which game net includes at least one rope type member supporting said net in a spaced relationship above the surface of the game court said support post apparatus comprising, in combination, a net, a rope-type member supporting said net and a rigid, substantially hollow, elongate support member having an upper end portion and a lower end portion, said rigid elongate support member having a first longitudinal surface and a second longitudinal surface, said first longitudinal surface being the surface adjacent said net, said support member having means defining a channel proximate the upper end portion of said support member for receiving and guiding said rope type member; said support member having guide means extending through at least one wall of said support member and spaced from said channel means for passage of said one rope type member from said second surface to said first surface; and retaining means coupled to said first surface of said support member for engaging and operatively straining said rope type member.

4,092,025

BASEBALL BAT MADE OF FIBER-REINFORCED PLASTICS

Seiichi Yanagioka, Hiratsuka, Japan, assignor to Aikoh Co., Ltd., Tokyo, Japan

Filed May 19, 1976, Ser. No. 688,057
Int. Cl.[2] A63B *59/06*
U.S. Cl. 273—72 R **5 Claims**



1. A baseball bat comprising an elongated body composed of fiber-reinforced plastic material having on at least part of the surface thereof a metallic plating selected from the group consisting of nickel and nickel base alloys.

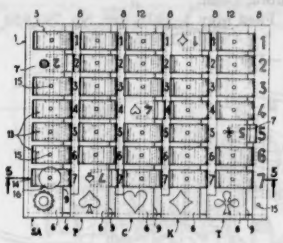
4,092,026

SILENT DECLARER

Robert Barbier, "Le Gallia Bella" 36 Avenue Isola Bella 06400, Cannes, France

Filed Jan. 18, 1977, Ser. No. 760,266
Claims priority, application France, Jan. 20, 1976, 76 01342
Int. Cl.[2] A63F *1/18*
U.S. Cl. 273—148 R **8 Claims**

1. A device for enabling a player to make silent declarations in the game of bridge, comprising a case having a side, five columns respectively corresponding to the five declarable suits, each column comprising at least seven regions on said side respectively corresponding to the seven possible values of declarations in each suit, indications respectively located in said regions, each indication representing a suit and a rank of a declaration in each region, and means associated with each of said regions for selectively displaying and preventing the display of the indication of each of said regions comprising movable masking means, the device further comprising plates of at least three distinct types respectively symbolizing the general declarations "pass," "double" and "redouble," the plates and



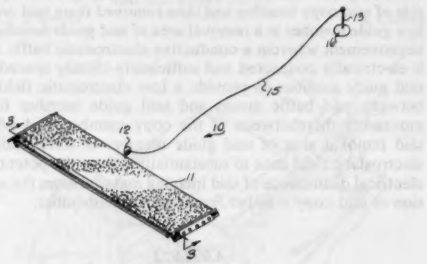
the masking means comprising complementary means for removably fixing said plates to said masking means.

4,092,027

GOLF PRACTICE DEVICE

Lee T. Carter, 9224 Greenback La., Orangevale, Calif. 95662

Filed Sep. 14, 1976, Ser. No. 723,132
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—195 R **4 Claims**



1. A practice golf driving range comprising a driving area, a golf ball, a stretchable cord attached at one end to the ball, and a metal spike for attachment to the other end of the cord, said driving area including an artificial turf surface, a pair of inverted, parallel angle irons supporting said surface at opposed extremities of said surface having tensioning means separating said angle irons further including parallel rods connecting said angle irons at their extremities having threaded medial portions with turnbuckles which serve to lengthen said rods.

4,092,028

BOARD GAME APPARATUS

Salvadore Marse, 320 S. Harrison St., East Orange, N.J. 07018

Filed Jan. 5, 1977, Ser. No. 756,775
Int. Cl.[2] A63F *3/04*
U.S. Cl. 273—239 **10 Claims**

1. A presidential election game for one of the players to win and thus become "President, " said game comprises in combination:

a. a playing board having its periphery divided into a series of outer zones and a series of inner zones,

b. said series of one of said zones being divided into fifty-one State zones including the District of Columbia, each State zone being color designated,

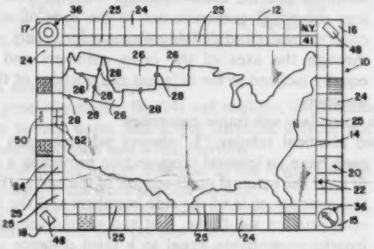
c. said other of said series of said zones being a corresponding numerical indicium being designative of the number of popular and/or electoral college votes allocated to said state, and needed to win the state according to the number of players of the game,

d. a map of the United States disposed centrally of said playing board, the boundaries of each State being outlined on said map,

e. said States being divided into different groups by color designation according to their population and for electoral votes representation,

f. pathways between adjoining States on said playing board,

g. a set of chance cards, each chance card having indicia thereon representative of an advantage one player may exercise over another player or a hazard that a player must suffer,



h. chance means operable by players of said game apparatus so as to produce a random number for determining the number of States the player may advance,

i. posting means for indicating the number of popular and/or electoral votes posted by a player as the game progresses, and

j. a marker for each player that differs in color or configuration, said marker placed initially on one of said States by each said player and progressively moving from State to State by utilization of said chance means through said pathways and accumulating votes in order to win the election and become "President."

4,092,029

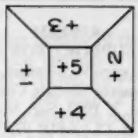
CHANCE CONTROLLED COUNTING GAME

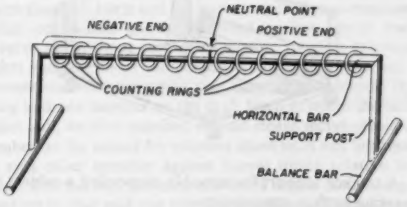
David L. Jones, 4341 Cole Pl., Caddo Parish, Shreveport, La. 71109

Filed Jul. 9, 1976, Ser. No. 703,977
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—271 **1 Claim**

1. A counting game comprising a playing board for each player, each playing board having a sequentially numbered array of playing spaces including at least one finish space, a plurality of marker chips for each player equal in number to the number of playing spaces on each board, a first die having a number on each face thereof for randomly determining for each player during his successive turn how many chips he is to place on sequentially numbered spaces on his playing board, a counting rack for each player, said counting racks each comprising a horizontal bar with slidable elements thereon which are initially positioned adjacent one end of the bar, a second die having selected positive and negative numbers on the respective faces thereof, whereby each player, in turn, throws the first die, places chips on successive sequentially numbered spaces on his board equal in number to the topmost number of the thrown die and moves an equal number of slidable elements away from their initial positions, and when a selected number of elements have been so moved, the player being allowed to throw said second die and add or remove chips from the board in accordance with the topmost positive or negative number appearing on said second die, said game continuing until one player succeeds in covering his finish space or spaces and not

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
101	102	103	104	105					





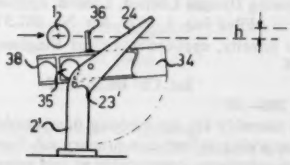
having said selected number of elements moved from their initial positions.

4,092,030

AN APPARATUS USING A PIVOTED WEIGHT MECHANISM FOR LIFTING THE TONE ARM OF A RECORD PLAYER

Daniel Seps, SeeStrasse 336, 8038 Zurich, Switzerland

Filed May 31, 1977, Ser. No. 801,553
Claims priority, application Switzerland, Jun. 1, 1976, 6837/76
Int. Cl.[2] G11B *3/10*
U.S. Cl. 274—1 R **10 Claims**



1. An apparatus for lifting the tone arm of a record player which tone arm moves along a path in a given direction at the time when the tone arm is to be lifted, said apparatus comprising:

a support;

balancing means mounted on said support for an across-center movement of its center of gravity from a first position to a second position, in said first position said center of gravity being relatively close to and above center so as to require minimal force in a specific direction to move said balancing means across center, in said second position said center of gravity being remote from and below center so as to be a relatively stable position, said balancing means being in said first position and having a portion positioned in said path and with said specific direction substantially coincident with said given direction so that upon said movement of the tone arm in said given direction, said tone arm engages and moves the balancing means across center; and

means comprising, at least in part, a part of said balancing means, for engaging, lifting and supporting said tone arm upon said tone arm so moving into the balancing means and so moving the latter across center.

4,092,031

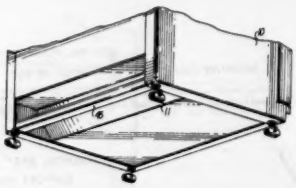
TRACKED SUPPORT FOR A CABINET

Carl R. Greer, and Clarence W. Denham, Jr., both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Jan. 3, 1977, Ser. No. 756,231

Int. Cl.[2] A47B *91/00*

U.S. Cl. 280—28.5 **9 Claims**



1. A tracked support for movably supporting a cabinet on a supporting surface comprising:

(a) a carrier;

(b) means for mounting said carrier on the cabinet;

(c) said carrier including a flat horizontal load-bearing portion having a substantial area; and

(d) a continuous flexible track mounted on said carrier and adapted to engage the supporting surface;

(e) said track extending across said load-bearing portion whereby the weight of the cabinet is distributed over a substantial area of the supporting surface corresponding to the area of said load-bearing portion of said carrier;

(f) said track being movable relative to said carrier to facilitate movement of said cabinet.

4,092,032

ASSEMBLY KIT FOR ERECTING DEMOUNTABLE FRAME STRUCTURES

Andrew Christo Pittas, London, England, assignor to Pittas Engineering Designs Limited, London, England

Filed Jun. 1, 1977, Ser. No. 802,574

Claims priority, application United Kingdom, Jun. 4, 1976, 23242/76

Int. Cl.[2] B62B *3/02*

U.S. Cl. 280—30 **8 Claims**

1. An assembly kit, for erecting demountable frame structures, comprising at least one primary sub-frame, at least one secondary sub-frame, connectable to said primary frame, and at least one extension sub-frame connectable to said primary frame and to said secondary frame, in which:

each primary sub-frame comprises:

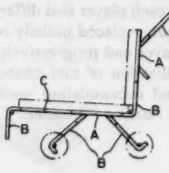
two identical tubular side members which each have opposite ends, intermediate portions respectively spaced a first distance apart, and end portions extending to said opposite ends from said intermediate portions,

two equal length cross members extending perpendicularly between the side members from said intermediate portions of the side members which are spaced a first distance apart and respectively spaced by a second distance from said opposite ends of the side members, and

four tubular legs, of equal length and having a free end and the same cross-section as the side members, extending from said intermediate portions of the side members to one side of a plane defined by the axes of the side members and the cross members with the axes of the legs extending perpendicular to the axes of adjacent cross members and defining planes respectively passing through the axes of the cross members and being equally inclined to the adjacent end portions of the side members;

each secondary sub-frame comprises:

two identical tubular "L"-shaped side members which each have an internal cross-section providing a sliding fit over the external cross-section of the end portions of the opposite ends of the side members and the legs of each primary sub-frame, first and second arms having lengths respectively equal to a third distance greater than said second distance and to said second distance, and a junction between said first and second arms, each first arm having a free end and an intermediate portion spaced from said free end by a distance equal to said second distance,



a first cross member extending perpendicularly between the first arms of the "L"-shaped members from said intermediate portions of the first arms of the "L"-shaped side members respectively spaced from said free ends of said first arms by a distance equal to said second distance, and

a second cross member extending perpendicularly between the junctions of the two arms of both "L"-shaped side members so that said junctions both engage the same side of the second cross member at opposite ends of the second cross member; and

each extension sub-frame comprises:

two identical tubular side members, and

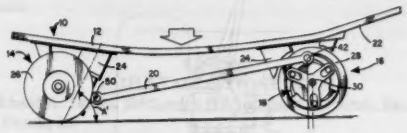
two cross members both equal in length to the cross members of each primary sub-frame and extending perpendicularly from the side members of the extension sub-frame from said intermediate portions of the side members of the extension sub-frame respectively spaced by said second distance from said opposite ends of the side members of the extension sub-frame, the side members of the extension sub-frame respectively comprising long portions of the same external cross-section as the side members and legs of each primary sub-frame and adjacent short portions each having a free end, a length equal to said second distance and an internal cross-section which is a sliding fit over the external cross-sections of the side members and legs of each primary sub-frame.

4,092,033

SKATEBOARD HAVING A FLEXIBLE AND RESILIENT CHASSIS WITH SPEED CONTROL MEANS

Stephen C. Swain, Westport, Conn., assignor to March Enterprise, Westport, Conn.

Filed Oct. 5, 1976, Ser. No. 729,659
Int. Cl.[2] B62B 7/00
U.S. Cl. 280—87.04 A 21 Claims



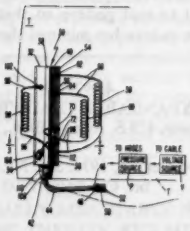
1. A skateboard comprising:
a. a generally planar, flexible and resilient, longitudinal chassis having upper and lower surfaces, a front portion, a central portion and a rear portion;
b. front wheel means attached to the lower surface of the chassis at the front portion thereof;
c. rear wheel means attached to the lower surface of the chassis at the rear portion thereof;
d. brake means for controlling the speed of at least one of said wheel means; and,
e. means responsive to the upward flexing of the central portion of said chassis for controlling the engagement of said brake means.

4,092,034

UNITIZED POWER OUTLET HOUSING FOR TRUCK TRACTOR BODY

Robert Becker, 2123 Fern Valley Rd., Louisville, Ky. 40213

Filed Nov. 3, 1976, Ser. No. 738,304
Int. Cl.[2] B60D 1/08
U.S. Cl. 280—420 24 Claims



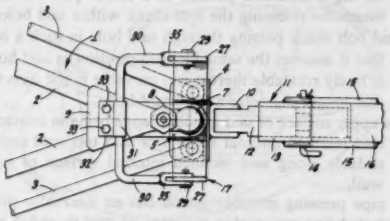
1. In combination:
a tractor body containing sources of air pressure and electricity;
a unitized power outlet housing to be secured to said body;
means for mounting said housing on said body including a mounting plate located behind a wall of said tractor body, said plate including stud means extending through apertures in said body for supporting said housing;
said housing including a pneumatic outlet;
a first hose for supplying air pressure from said air pressure source to said pneumatic outlet;
an electrical outlet; and
a first cable for supplying electricity from said electricity source to said electrical outlet.

4,092,035

DEVICE TO PREVENT BINDING OF A SWIVEL COUPLING IN A TRAILER HITCH ARRAY

Richard E. Warner, 1530 Edgewood Dr., Lodi, Calif. 95240

Filed Apr. 25, 1977, Ser. No. 790,848
Int. Cl.[2] B60D 1/12
U.S. Cl. 280—446 R 10 Claims



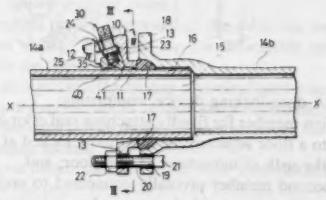
1. A device to prevent binding of the swivel coupling in a trailer hitch array which includes a draft hitch adapted to project forwardly from a trailer, the swivel coupling being of longitudinal pintle type and adapted to project rearwardly from a towing vehicle, a mount to which the rear end of the swivel coupling is fixed, and a ball and socket unit connected between the forward end of the draft hitch and the mount, the ball being fixed on and upstanding from the mount and the socket being fixed on the draft hitch; said device being characterized by the inclusion of instrumentalities, connected between the draft hitch and the mount, operative to maintain the socket centralized on the ball and against lateral cocking thereon, yet without restricting relative rotation between the socket and ball about the perpendicular axis of said ball; said instrumentalities comprising one member, first means rigidly fixing said one member on the draft hitch adjacent the ball and socket unit, another member, second means securing said other member on the mount for rotation about such axis but restraining said other member against lateral tilting relative to the mount and the ball thereon, and third means connecting said members so that said one member restrains said other member against lateral tilting relative to the draft hitch.

4,092,036

PIPE JUNCTION HOLDER

Toshiyuki Sato, and Hideo Edo, both of Osaka, Japan, assignors to Kabushiki Kaisha Suiken, Osaka, Japan

Filed Dec. 15, 1976, Ser. No. 750,626
Claims priority, application Japan, Dec. 15, 1975, 50-169916[U]
Int. Cl.[2] F16L 19/02
U.S. Cl. 285—337 21 Claims



1. A pipe junction holder comprising:
a substantially annular body which includes a plurality of clamping blocks which are integral with said annular body and are disposed in spaced relation with one another, each of said clamping blocks comprising a hollow internal space defined by a front wall, a pair of side walls, and a top wall which has an inclined internal surface descending away from said front wall;

said top wall having a non-threaded through hole which is substantially elliptical in shape, having a longer diameter axis directed toward said front wall, and being inclined relative to a longitudinal axis of a pipe on which the pipe junction holder is mounted;

a plurality of bolts each of which has a bolt shank with an integral annular flange formed therewith, said bolt shank having a threaded portion at a lower part thereof and means for retaining the bolt shank within said hole;

said bolt shank passing through said hole in such a manner that it assumes the same inclined position as said hole and is freely rotatable therein and movable in the direction of said longer diameter axis of said hole;

an upper surface of said annular flange being in contact with said inclined internal surface of said top wall and being slidable along said inclined internal surface of said top wall;

a pipe pressing member which has an internally threaded hole being engageably mounted on said threaded portion of said bolt shank, said pipe pressing member being received within said internal hollow space of each of said clamping blocks in such a manner that it is movable together with said bolt shank substantially in the direction of said longer diameter axis of said hole, said internal hollow space prevents the pipe pressing member from rotating about said bolt shank;

a plurality of edges being formed on a bottom of said pipe pressing member, each of said edges being of a configuration that permits denting into a peripheral wall of a pipe on which the pipe junction holder is mounted; and

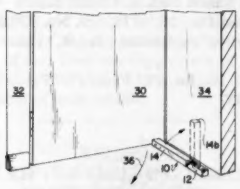
said pipe junction holder being adapted to be positioned adjacent a second pipe by means of a through hole in the annular body which is aligned with a through hole in an annular flange of a second pipe which may be secured together by means of a fixing bolt.

4,092,037

DOOR-LOCKING DEVICE

Albert T. Greenwald, 875 Ray Ave., Union, N.J. 07083

Filed Jun. 2, 1977, Ser. No. 802,362
Int. Cl.² E05C *3/04*
U.S. Cl. 292—202 **6 Claims**



1. A door-locking device, comprising:

a first member for fixedly attaching said door-locking device to a floor adjacent the door to be locked at a point out of the path of movement of said door; and

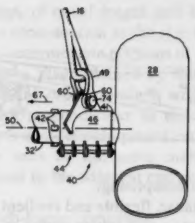
a second member pivotally connected to said first member and being movable between a lower locking position and an upper retracted position, the lower locking position of said second member being longitudinally aligned with said first member and in the path of movement of said door to prevent said door from being moved from a closed position to an open position, and said second member being pivotable upwardly to said retracted position out of the path of movement of said door to allow movement of said door from said closed position to said open position.

4,092,038

JACKET WITH IMPROVED LIFTING MEANS

Robert S. Harris, Blytheville, Ark., assignor to Brown & Root, Inc., Houston, Tex.

Filed Feb. 16, 1977, Ser. No. 769,170
Int. Cl.² B66C *1/34*
U.S. Cl. 294—78 R **7 Claims**



1. In a jacket for use in supporting an offshore platform having a plurality of legs interconnected by a plurality of bracing members, a number of said bracing members having means for connection with the cables of apparatus for lifting the jacket during transportation and positioning thereof, the improvement wherein said connection means comprises:

a padeye mounting site on said bracing member comprising a cylindrical, padeye receiving portion bounded axially on at least one side by stop means; and

a self-aligning, reusable padeye for connection with said receiving portion comprising

a pair of hemispherical clamp members joined by a hinge, said clamp members, when closed, forming a cylindrical hollow sized to rotatably fit about said receiving portion and having a central axis, and

an eyelet rigidly mounted on each said clamp member defining a hole for receiving a pin, the axis of the hole in each said eyelet being skewed with respect to said central axis, said eyelets having stop surfaces for limiting the extent of closure of said clamp members so as to provide said rotatable fit and for maintaining registration of the pin receiving holes in said eyelets when said clamp members are closed,

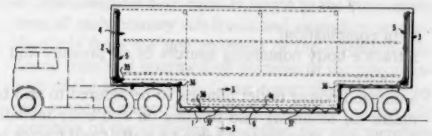
said padeye being operable to rotate about said central axis in response to force applied by the cable of the lift apparatus attached to said padeye so that, during lifting, the stress on the padeye has minimal shear components.

4,092,039

EXPANDABLE TRAILER VAN

Dan J. Lutkenhouse, 479 S. Airport Blvd., South San Francisco, Calif. 94080

Filed Oct. 14, 1976, Ser. No. 732,394
Int. Cl.² B60P *9/00*
U.S. Cl. 296—26 **20 Claims**



1. An expandable trailer van comprising, a chassis frame, an extensible front wall and an extensible rear wall connected to said chassis frame, a flexible tarpaulin connected to the front and rear walls, said tarpaulin forming the roof and side walls of said van, means connected to the tarpaulin for raising and lowering the side walls thereof, means connected to said front and rear walls for raising and lowering said walls, and means

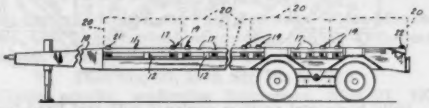
connected between the side edges of the tarpaulin and the side edges of the front and rear walls for sealingly connecting the tarpaulin edges to the respective wall edges; said sealing means comprising a vertically disposed cable extending through a selvage on each vertical edge of the tarpaulin, one end of each cable being connected to the upper end portions of the front and rear walls on each side thereof, the lower end of each cable being connected to the chassis frame, and tension means connected between the lower end of each cable and the chassis frame.

4,092,040

ADJUSTABLE TWIST LOCK

Richard A. Tatina, Bridgeview, Ill., assignor to Portec, Inc., Oak Brook, Ill.

Filed Sep. 28, 1976, Ser. No. 727,426
Int. Cl.[2] B62D *23/00*
U.S. Cl. 296—35 A **10 Claims**



1. In an adjustable twist lock assembly, adjustably moveable along a flatbed container carrying vehicle for locking a container on the vehicle and in combination with a C-channel extending along each side of the vehicle for substantially the length thereof,

each channel opening to the outside of the vehicle and having a web, a bottom flange and a top flange having openings spaced therealong to receive a twist lock,

each twist lock assembly including a framework conforming to the C-channel and accessible from the outside of said channel for manually moving said framework along said channel into registry with an opening in said top flange, said open framework having an open top to accommodate raising of the twist lock assembly from beneath the top flange of the channel through said opening into position to lock a container to the vehicle,

a lock housing guided in said framework for vertical movement along the framework,

a twist lock having a depending stud pivotally mounted in said lock housing and extending therebeneath,

a camming member transversely pivoted to said stud,

and a single lever accessible from the outside of said C-channel for moving said camming member to cam said lock housing and stud vertically and for pivotally moving said camming member and stud to turn said twist lock at least 90° to lockingly engage a container fitting.

4,092,041

CHAIR UNIVERSALLY ADJUSTABLE BY OCCUPANT RECLINING THEREIN, AND METHOD

Archie C. Landry, Canoga Park, and Alexander C. Daswick, South Pasadena, both of Calif., assignors to Alexander C. Daswick, South Pasadena, Calif.

Filed Jan. 21, 1977, Ser. No. 760,997
Int. Cl.[2] A47C *1/02, 3/02*
U.S. Cl. 297—68 **43 Claims**

1. An adjustable reclining chair comprising:

a support frame assembly including means providing front and rear suspensions;

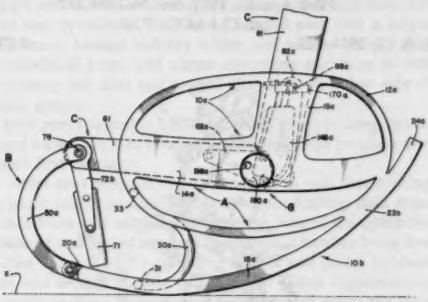
a body rest assembly including a seatrest, a backrest, and means hingedly securing the rearward end of said seatrest to the forward and lower end of said backrest;

means pivotally supporting the forward end of said seatrest upon said front suspension;

means pivotally supporting said backrest, at a mid-point along the length thereof, upon said rear suspension; and

the horizontal distance between said front and rear suspensions being easily adjustable;

whereby an occupant of the chair may manipulate his body



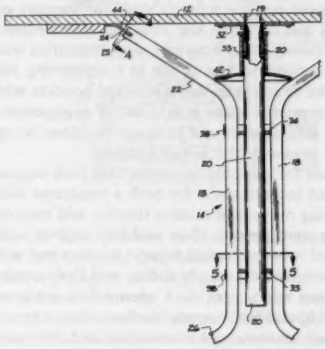
and the body rest assembly between sit-up and reclining positions without substantially raising or lowering the composite center of gravity of his body and the body rest assembly.

4,092,042

TABLE AND SEAT CONSTRUCTION

Dan C. Cusenbary, Cunningham, Kans. 67035

Filed Mar. 11, 1977, Ser. No. 777,157
Int. Cl.[2] A47C *7/62*
U.S. Cl. 297—157 **7 Claims**



1. A picnic table structure supported by a plurality of radially spaced legs comprising:

a table top having a center point;

mounting means on the underside of the table top radially positioned around the table top for detachable engagement with the legs;

a plurality of legs each leg having a vertical center section, an outwardly spread upper section and a horizontal lower section, the ends of the upper section engaging the table top mounting means;

individual seat means attached to the outer ends of the lower section of the legs;

a center post attached to the center point of the table top extending downwardly between the legs in adjacent side-by-side relation;

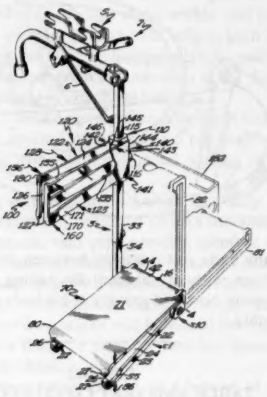
banding means surrounding and tightly restraining the center sections of the legs and the center post;

sleeve means on the center post adjustable longitudinally into contact with the upper sections urging the legs to spread against the banding means thereby causing a more rigid structure.

4,092,043
LIMB SUPPORT APPARATUS

Roman G. Wieland, 8493 Innsdale S., Cottage Grove, Minn. 55016

Filed Apr. 11, 1977, Ser. No. 786,337
Int. Cl.[2] A47C 7/50
U.S. Cl. 297—429 8 Claims



1. A limb support apparatus suitable for use on a patient-support device, which comprises:

(a) at least one mounting arm carried by the patient-support device;

(b) a limb support surface, said limb support surface having a support position wherein said limb support surface engages and supports the limb, an intermediate position transversely offset from said support position wherein said limb support surface is not in a supporting relationship relative to the limb, and a stowage position wherein said limb support surface is held out of engagement with the limb, said support and stowage positions being substantially perpendicular to one another;

(c) means for movably mounting said limb support surface on said mounting arm for both a transverse sliding and a pivoting movement relative thereto, said mounting means being configured to allow said limb support surface to be moved between its said support position and said stowage position by transversely sliding said limb support surface between said support and intermediate positions, and by rotating said limb support surface relative to said mounting arm between said intermediate and said stowage positions, whereby said limb support surface may be moved between said support position and said stowage position without moving the limb.

4,092,044
CONVERTIBLE LIVESTOCK-GRAIN TRAILER

James W. Hoffman, Box 8, Wilmont, Minn. 56185

Continuation of Ser. No. 657,311, Feb. 11, 1976, abandoned.
This application Jan. 5, 1977, Ser. No. 756,851
Int. Cl.[2] B60P 1/00
U.S. Cl. 298—27 1 Claim

1. A convertible livestock-grain trailer comprising:

(a) a box-like trailer housing including a floor member, a pair of side wall members, a front wall member, a back wall member, and a roof member;

(b) wheel means connected beneath said floor member near the back end of the trailer;

(c) hitch means connected underneath said floor member near the front end of the trailer;

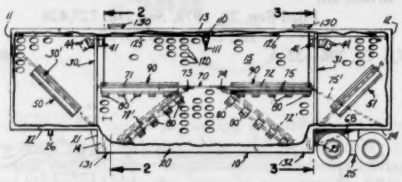
(d) a front bull gate normally vertically disposed between said floor member and roof member and between said pair of side wall members and spaced from said front wall member to define a front compartment within said trailer;

(e) a rear bull gate normally vertically disposed between said floor member and roof member and said side wall members, and spaced from said back wall member to define a rear compartment, with a center compartment between said front and rear compartments;

(f) a fixed second livestock floorboard connected between said side wall members;

(g) a pair of movable floor board members;

(h) means pivotally connecting one end of each of said movable floor boards between said side wall members adjacent said fixed floorboard in said floorboard in said center compartment for pivotal motion between a first substantially horizontal position coplanar with said fixed floorboard in which said floor boards form a second livestock floor, and a second position in which said movable floor boards pivot downwardly toward said front and rear compartments respectively; and means for removably attaching to said side wall members for supporting the edges of said floor boards in their substantially horizontal position and for attachment in an alternate position on said side walls for supporting the edges of said floor boards when in their downward position so as to define a pair of grain hoppers within said center compartment; and

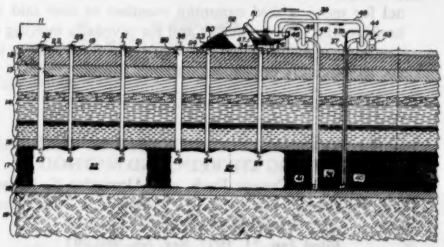


(i) a pair of grain outlet means in said floor members at the base of each of said grain hoppers for unloading grain therethrough.

4,092,045
SUBTERRANEAN HYDRAULIC MINING METHOD

Thomas M. Sullivan, 3953 Oregon St., San Diego, Calif. 92104

Filed Oct. 6, 1975, Ser. No. 619,787
Int. Cl.[2] E21B 43/26, 43/28; E21C 41/04
U.S. Cl. 299—17 6 Claims



1. A method of subterranean hydraulic mining comprising the steps of,

drilling an input shaft from the terranian surface into a sedimentary deposit to be mined,

drilling an output shaft spaced from the input shaft, from the terranian surface into the sedimentary deposit to be mined,

using a shaped charge at the lower end of one of the shafts and cracking the sedimentary deposit generally between the input shaft and the output shaft,

forcing a fluid down the input shaft and jetting the fluid at a vertical jetting location into the cracked sedimentary

deposit with the fluid carrying portions of the sedimentary deposit to the vicinity of the output shaft,

positioning the lower end of the output shaft below the fluid level whereby the fluid and sedimentary deposit move by fluid flow to a receiving opening in the lower end of the output shaft,

using a pump in the lower end of the output shaft to move the sedimentary deposit and fluid up the output shaft to the terranian surface,

selectively moving the jetting location of jetting of the fluid vertically in the sedimentary deposit while maintaining the lower end of the output shaft at or near the bottom of the opening in the sedimentary deposit cut by the fluid flow from the input shaft,

and maintaining a cavity around the output shaft and input shaft that is not filled with liquid.

4,092,046

PNEUMATIC FEEDER-DISPENSER FOR BULK MATERIAL

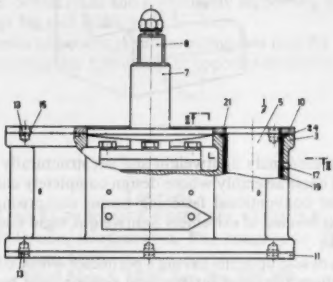
Nino Bombelli, Urdorf, and Willy Trutmann, Widen-Mutschellen, both of Switzerland, assignors to Spribag Aktiengesellschaft, Widen-Mutschellen, Switzerland

Filed May 27, 1975, Ser. No. 580,713

Claims priority, application Switzerland, May 31, 1974, 7474/74

Int. Cl.[2] B65G *53/46*

U.S. Cl. 302—49 **10 Claims**



1. A feeder-dispenser for bulk material, such as mortar, concrete and the like, comprising a rotor mounted on a driving shaft to be rotated thereby and comprising a top frontal plate, a bottom frontal plate and a plurality of tubular material receiving chambers open at each end fixed between said plates, each of said chambers being at least partially covered on their internal surfaces with a tubular elastic material lining, secured at its ends with respect to said chamber and being flexibly distendable with respect to the wall of said chamber, the wall of each chamber being provided with a hole permitting movement of air between the lining and the chamber wall.

4,092,047

CONTROL DEVICE FOR A MOTOR VEHICLE PNEUMATIC BRAKING SYSTEM

Giuseppe Amedei; Carlo Alberto Quilico, both of Turin, and Virginio Maggioni, Rosta (Turin), all of Italy, assignors to FIAT Societa per Azioni, Turin, Italy

Filed Jul. 15, 1976, Ser. No. 705,490

Claims priority, application Italy, Jul. 29, 1975, 68971 A/75

Int. Cl.[2] B60T *8/22*

U.S. Cl. 303—22 R **1 Claim**

1. A control device for a pneumatic braking system of a motor vehicle, comprising:

a generally cylindrical housing,

respective transverse end walls closing each end of said generally cylindrical housing,

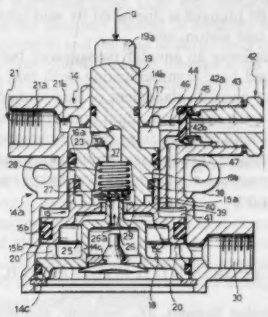
a cylindrical bore in said housing,

a piston slidable along said cylindrical bore in said housing, said bore having first and second parts of relatively small and large diameters respectively, said piston having a first part with a smaller diameter located within said first part of said cylindrical bore, and a second part with a larger diameter located slidably within said second part of said cylindrical bore, said piston separating said bore in said housing into first and second chambers on either side of said piston,

an inlet port adapted to be connected in a first braking circuit and located in said housing for leading fluid pressure into said first chamber,

an outlet port adapted to be connected in said first braking circuit and located in said housing for leading fluid pressure from said second chamber, the area of the operative face of said piston exposed in said first chamber being less than the area of the operative face of said piston exposed in said second chamber so that said piston experiences a resultant force towards said first chamber when the fluid pressure in both chambers is the same,

means defining a fluid transfer passageway between said first and second chambers, said means including said piston and incorporating a variable restrictor passage controlled in dependence on the position of said piston such that the size of said restrictor passage is reduced upon movement of said piston towards said first chamber whereby to



reduce the fluid pressure in said second chamber with respect to that in said frst chamber,

means for applying to said first part of said piston a fluid pressure force in a sense such as to resist said resultant force tending to move said piston towards said first chamber due to the difference in area between the faces of said piston exposed in said first and second chambers respectively, whereby, when said resultant force acting on said piston due to said difference in areas of said piston faces in said first and second chambers exceeds said fluid pressure force applied to said first part of said piston, said piston is displaced towards said first chamber thereby reducing the size of said restrictor passage and thus the fluid pressure in said second chamber until the forces on said piston are balanced, thereby attenuating the fluid pressure at said outlet port with respect to that at said inlet port,

a plunger, which is slidable within that part of the bore defining said first chamber and mechanically linked to said piston so that a load responsive force applied to said plunger to depress it towards said piston is transferred to said piston, there being an opening in one end wall of the housing through which projects one end of said plunger on which end can be applied said load responsive force whereby to resist said resultant force tending to move said piston towards said first chamber within said housing in use of said device,

means defining an annular chamber facing said second part of said piston opposite said second chamber,

means defining an internal passageway communicating at one end with said annular chamber and at the other end with said first chamber,

means defining an auxiliary port adapted to be connected to a second braking circuit and located in said housing adjacent said internal passageway,

a valve shutter in said auxiliary port movable between a first position blocking fluid communication between said first and annular chambers when fluid pressure from said second brake circuit is applied at said auxiliary port equal to or greater than the fluid pressure at said inlet port and a second position allowing fluid communication between said first and annular chambers through said internal passageway,

said plunger having a recess in the other end thereof defining an intermediate chamber,

axial and radial passageways in said plunger providing fluid communication between said intermediate chamber and said first chamber,

said transfer passageway providing fluid communication between said intermediate chamber and said second chamber, the dimensions of said intermediate chamber being such that the fluid pressure entering said intermediate chamber causes an upward thrust on said plunger greater than a downward thrust exerted on said plunger by the fluid pressure contained in said first chamber so that in the absence of any said load responsive force acting on said plunger and said valve shutter being in said second position the plunger is displaced by said upward thrust away from said piston, and

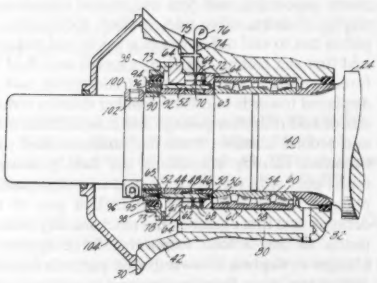
means defining an annular passageway between said piston and said bore communicating with said annular chamber so that upon displacement of said plunger out of engagement with said piston fluid communication will be established between said intermediate chamber and said annular chamber through said annular passageway thereby the fluid pressure at said outlet port being equal to that at said inlet port.

4,092,048

ROLL SUPPORTS WITH HYDROSTATIC AND ROLLER BEARINGS

Robert Gordon Bennett, Jr., Seymour, and Richard Louis Bonanzio, Stratford, both of Conn., assignors to USM Corporation, Farmington, Conn.

Filed Feb. 17, 1977, Ser. No. 769,773
Int. Cl.[2] F16C *13/00*
U.S. Cl. 308—9 **6 Claims**



1. A journal box for supporting a roll journal, said journal box comprising:

a frame;

a first bearing mounted in said frame for supporting a roll member during rotation therein;

a second bearing arrangement mounted in said frame for concise radial support of said roll member during rotation therein;

said second bearing arrangement comprising a plurality of hydrostatic pistons radially movably disposed in a housing disposed in said frame; said hydrostatic pistons activatable upon requirement for close tolerance work with respect to said roll member; and

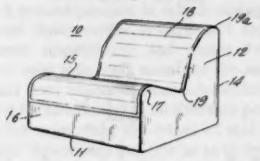
securing means connected between said housing and said roll journal to retain said first bearing and said second bearing arrangements within said frame, said securing means comprising; a nut engagement ring threaded on its outer periphery, and disposed outwardly of the outboard edge of said second bearing arrangement; a lock nut threaded about said nut engagement ring; and an end cap annularly disposed between said lock nut and said housing.

4,092,049

LIGHTWEIGHT KNOCKED-DOWN CHAIR DESIGN CONSTRUCTED OF INEXPENSIVE COMPONENTS

Svante Schoblom, Tranas, Sweden, assignor to Overman AB, Tranas, Sweden

Filed Oct. 21, 1976, Ser. No. 734,546
Int. Cl.[2] A47C *7/00*
U.S. Cl. 297—440 **17 Claims**



1. An extremely lightweight and yet structurally strong and rugged chair assembly whose design completely eliminates the need for conventional fastening means comprising a pair of uprights formed of extremely lightweight, rigid foamed plastic material;

each of said uprights having a perimeter whose configuration defines the front surface, seat portion, seat back portion, rear surface and bottom surface of the completed chair and each of said uprights having an interior surface provided with openings of a predetermined depth;

a plurality of hollow cylindrical paper tubes, each being inserted within a cooperating pair of openings of said uprights so that, when fully assembled, said tubes maintain the uprights in a spaced substantially parallel fashion;

a single one-piece fabric cover being pulled over the chair frame assembly and adapted to cover the front, rear, left and right-hand surfaces of the chair assembly, as well as the seat, back and top portions and further adapted to have a pair of flaps which are pulled about the bottom surfaces of the uprights;

means threadedly engaging said flaps for tautly maintaining the cover assembly about said chair frame assembly whereby only the uprights engage the cover and further maintain the cover a spaced distance from all of said tubes, even under the weight of a person using the chair.

4,092,050

RACK ASSEMBLY FOR A LAND VEHICLE

Gerald A. Sobeck, P.O. Box 97, Kellogg, Minn. 55945

Filed Oct. 5, 1976, Ser. No. 729,823
Int. Cl.[2] B60P *1/16*
U.S. Cl. 298—18 **17 Claims**

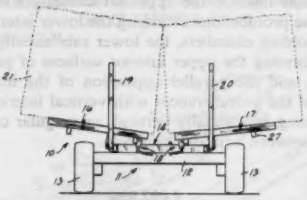
1. A rack assembly for a land vehicle, comprising:

(a) a base adapted to be fixedly secured to the vehicle;

(b) two load carrying racks each having a pivotal connection

with said base for respective movement between a load-supporting position and an unloading position, each said pivotal connection having a pivotal axis substantially parallel to the direction of the vehicle travel, a substantial portion of said racks respectively projecting beyond opposite sides of said base for projection beyond the side edges of the vehicle in both of said positions;

(c) a trip-lock mechanism acting between said base and said racks for releaseably holding said racks in said load-supporting position, upon the release of which said loaded



racks can tilt in response to gravity, said trip lock mechanism including at least two latch dogs engaging each said rack; and

(d) means on said base synchronizing the movement of said latch dogs to provide substantially simultaneous release thereof, said synchronizing means including

(1) a pair of rods pivoted on said base between the pivotal axes of said racks and respectively supporting said latch dogs for said racks, and

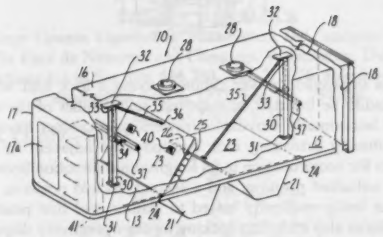
(2) means adjustably interconnecting said rods for simultaneous angular movement in opposite directions.

4,092,051

MULTI-PURPOSE FREIGHT VEHICLE

Peter J. D'Orazio, Southampton, Pa., assignor to The Budd Company, Troy, Mich.

Filed May 5, 1976, Ser. No. 683,358
Int. Cl.[2] B61D *3/06*
U.S. Cl. 298—24 **15 Claims**



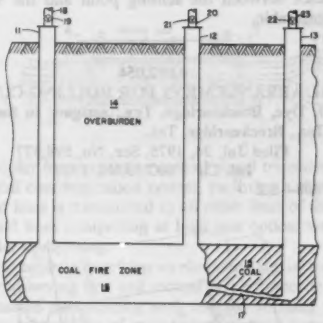
13. A multi-purpose freight vehicle, comprising in combination, a vehicle container having a floor, sidewalls, and roof, and opentop hopper beneath the floor, a fill opening in the roof above the hopper opening, a flexible container bag having an open bottom end disposed in the hopper opening, retaining means between the upper end of the bag and the car roof at said fill opening, a transversely hinged floor section trap door movable from a lower position covering the hopper opening to confine the side of the bag when raised and filled, a cross bar, and side wall anchorages for removably securing said cross bar in position to hold the trap door in raised position.

4,092,052

CONVERTING UNDERGROUND COAL FIRES INTO COMMERCIAL PRODUCTS

Ruel Carlton Terry, Denver, Colo., assignor to In Situ Technology, Inc., Denver, Colo.

Filed Apr. 18, 1977, Ser. No. 788,542
Int. Cl.[2] E21C *43/00*
U.S. Cl. 299—2 **15 Claims**



1. A method of controlling an underground coal fire, comprising the steps of:

redistributing the overburden over the underground coal deposit with the resultant closing of conduits between the surface of the earth and the said underground coal deposit,

establishing a first communication passage from the surface of the earth to the said underground, the said first communication passage being hermetically sealed,

establishing a second communication passage from the surface of the earth to the said underground coal, the said second communication passage being spaced apart from the said first communication passage and the said second communication passage being hermetically sealed,

injecting a reactant fluid into the said first communication passage and into the said underground coal, and

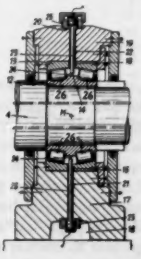
withdrawing the products of reaction between the said reactant and the said underground coal through the said second communication passage.

4,092,053

BEARING ARRANGEMENT FOR A TILTING TRUNNION OF A METALLURGICAL VESSEL

Ernst Riegler, Enns, and Manfred Schmidt, Linz, both of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Jan. 31, 1977, Ser. No. 764,209
Claims priority, application Austria, Feb. 3, 1976, 729/76
Int. Cl.[2] F16C *29/02*
U.S. Cl. 308—3 R **14 Claims**



1. In a bearing arrangement for a tilting trunnion of a metallurgical vessel, in particular for a converter in a steel making

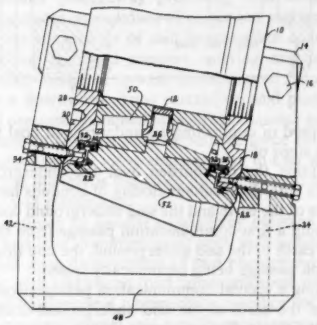
plant, of the type including a bearing within a bearing housing, having an inner race, an outer race and bearing bodies arranged therebetween, the improvement comprising at least one sensor means for measuring changes in the weight of the vessel contents or the wear of the bearing and having a sensor pin, which at least one sensor means penetrates the outer race of the bearing and contacts the inner race thus forming a sensing point, the at least one sensor means also having a fixed point with the sensor pin being movable relative to the fixed point, the distance between the sensing point and the fixed point being measurable.

4,092,054

SEAL ARRANGEMENT FOR ROLLING CUTTER

James H. Dye, Breckenridge, Tex., assignor to Subterranean Tools Inc., Breckenridge, Tex.

Filed Jul. 24, 1975, Ser. No. 598,577
Int. Cl.[2] F16C *33/66, 1/24*
U.S. Cl. 308—8.2 14 Claims



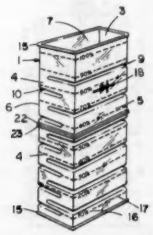
1. A rolling cutter having a central portion in the form of a support shaft, an outer body rotatable relative to said support shaft, bearing means operatively interposed between said shaft and said outer body, first seal means sealing between said outer body and shaft adjacent said bearing, second seal means sealing between said outer body and said shaft and spaced from said first seal means so as to define a cavity bounded by said seal means and said shaft and said outer body, means for conducting fluid into one end of said cavity, so as to flush fluid outwardly from said second seal means.

4,092,055

PARTS-HANDLING MAGAZINE

Robert W. Wullenwaber, 1141 St. Regis Pl., Santa Ana, Calif. 92705

Filed Sep. 8, 1975, Ser. No. 611,523
Int. Cl.[2] A47F *1/00*
U.S. Cl. 312—45 17 Claims



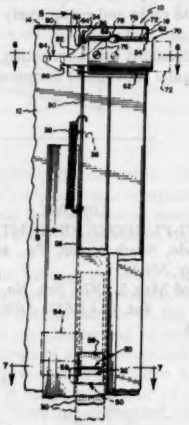
1. A parts-handling magazine comprising a plurality of at least two vertically disposed chambers interior to two pairs of substantially vertical walls, the first pair of vertical walls lying substantially within two parallel vertical planes, the second pair of vertical walls having a plurality of indentations of substantially rectangular vertical cross section, the indentations spanning the interior distance between the first pair of vertical walls and extending horizontally into the interior of the magazine beyond that vertical center plane of the magazine which is parallel to the indented second pair of vertical walls, the indentations in opposite walls alternating in vertical position with one another to form a series of interdigitated, horizontal protuberances having rectangular cross sections within the magazine interior, the upper substantially horizontal surfaces of the protuberances forming the lower interior surfaces of parts-holding chambers, the lower substantially horizontal surfaces forming the upper interior surfaces of parts-holding chambers, and the parallel opposition of the inner vertical surfaces of the protuberances with vertical interior wall surfaces forming substantially vertical, rectangular cross-section passages between adjacent chambers.

4,092,056

LOCKING DEVICE FOR FILE DRAWERS

Dennis J. Signore, Ellicottville, and Forest G. Stark, Jamestown, both of N.Y., assignors to AVM Corporation, Jamestown, N.Y.

Filed Aug. 4, 1977, Ser. No. 821,736
Int. Cl.[2] E05B *65/46*
U.S. Cl. 312—219 12 Claims



1. An improved drawer cabinet having a lock unit which may readily be inserted or removed, said cabinet of the type having horizontally moveable drawers, said cabinet having a longitudinally extending lock bar mounted adjacent to said drawers for reciprocation in its longitudinal direction between a first, unlocked position, and a second, locked position, said lock bar being resiliently biased to assume said first position, said cabinet also including locking means operatively disposed between said drawers and said lock bar for locking said drawers, and an access hole into the interior of said cabinet, the improvement comprising:

a. a lock assembly slidingly mounted in said access hole for reciprocation between a projecting, unlocked position and a relatively depressed, locked position, said lock assembly having a cam surface formed at an acute angle to the direction of reciprocation of said lock bar for engaging and for moving said lock bar between said first and second positions as said lock assembly is moved between said projecting and depressed positions respectively; and

b. means for preventing the outward movement of said lock assembly from its projecting position when said lock bar is

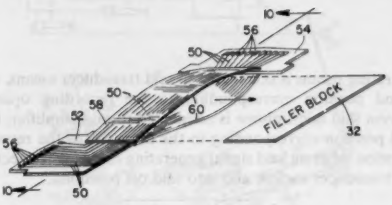
in said first position and for permitting complete outward removal of said lock assembly from said cabinet when said lock bar is in its second position.

4,092,057

FLEXIBLE CIRCUIT ASSEMBLY

Tommy L. Walton, Carlsbad, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 608,550, Aug. 28, 1975, Pat. No. 4,026,011. This application Feb. 2, 1977, Ser. No. 764,980
Int. Cl.[2] H05K 1/04
U.S. Cl. 339—17 F 3 Claims



1. A flexible circuit assembly having a rigid connector and a flexible interconnecting cable which does not require a separate electrical connection therebetween, said assembly comprising:

a rigid support member having a major surface and serving as a rigid connector;

a metallic clad insulating film bonded to said surface and extending from said rigid connector; and

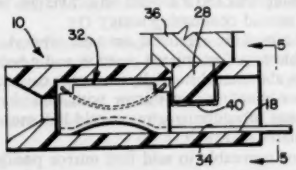
a plurality of spaced conductors on said insulating film, said conductors each having an enlarged portion, as an integral part thereof, at one end terminating on said rigid connector to form a contact pad and another end on the insulating film spaced from the rigid connector, each conductor and corresponding pad portion thereby providing a metallurgically continuous one piece interfaceless electrically conductive path from the rigid connector end to the insulating film which extends from the rigid connector, the combination serving as a flexible interconnecting cable.

4,092,058

CONNECTOR BLOCK

George Thomas Eigenbrode, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 646,390, Jan. 2, 1976, abandoned. This application Apr. 4, 1977, Ser. No. 784,456
Int. Cl.[2] H01R 9/16
U.S. Cl. 339—218 M 1 Claim



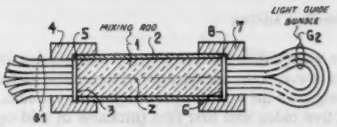
1. A connector block comprising a top wall, a bottom wall, spaced side walls extending between said top and bottom walls to define cavities, a terminal mounted in each cavity, and an elongated lock bar traversing and projecting through said top wall into said cavities adjacent said terminals, said bar being integral with said side walls in welded joints and having a side flush with the exterior of said top wall.

4,092,059

COUPLER FOR OPTICAL COMMUNICATION SYSTEM

Thaddeus Hawkes, and Jean-Claude Reymond, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 9, 1976, Ser. No. 740,193
Claims priority, application France, Nov. 14, 1975, 75 34889
Int. Cl.[2] G02B 5/16
U.S. Cl. 350—96.16 4 Claims



1. A coupler for connecting optical signal transmission lines in an optical communication system, such that a signal in any one of said lines is transmitted to all other lines of the system, each of said lines comprising at least one optical waveguide, said coupler comprising:

an optical mixer comprising an elongated rod of transparent material having first and second planar opposite endfaces and means surrounding said rod for forming with the peripheral surface of said rod comprised between said endfaces a light reflecting interface;

first support means for grouping one end of each of said lines which constitutes a first group of waveguides in a bundled parallel arrangement having endfaces disposed substantially in the plane of said mixer first endface;

a second group of optical waveguides; and

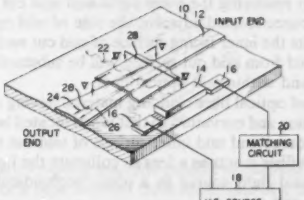
second support means for grouping the two ends of each waveguide of said second group together in a bundled parallel arrangement having endfaces disposed substantially in the plane of said mixer second endface.

4,092,060

THIN FILM OPTICAL SWITCHING DEVICE

Masahiro Nunoshita, and Yoshinori Nomura, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 10, 1976, Ser. No. 665,434
Claims priority, application Japan, Apr. 2, 1975, 50-40713
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.13 10 Claims



1. A thin-film optical switching device comprising, in combination, a substrate having a first refractive index, an optical waveguide disposed on said substrate, said optical waveguide having a width sufficiently larger than that of an optical guided wave and also sufficient flare to prevent the optical guided wave from disturbing a diffracted guided optical wave, and further having a second refractive index higher than said first refractive index and a first film thickness, a thin film member overlying at least one portion of said optical waveguide, said thin film member extending in a light propagation direction and a distance from the point where the waveguide starts to flare greater than the width of the sound wave and having a third refractive index higher than said second refractive index,

a relatively large value of acousto-optical figure-of-merit and a second film thickness, and an electromechanical transducer means on said substrate and positioned laterally of said waveguide for generating an elastic surface wave to propagate it through said thin film member, said transducer being oriented so that an angle θ formed between the wave front of an elastic surface wave generated by said transducer and an incident guided optical wave fulfills the requirement for the Bragg diffraction

$$\sin \theta = \lambda o/2n\Lambda$$

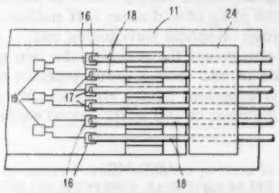
where n designates the effective refractive index for the optical guided wave, Λ the wavelength of the elastic surface wave and λo designates the wavelength of light in a vacuum, said second refractive index and first film thickness of said optical waveguide and said third refractive index and second film thickness of said thin-film member having respective values for imparting to the device a sufficiently high diffraction efficiency at an optical wavelength used with the device.

4,092,061

SIDE-COUPLING OF LIGHT FOR AN OPTICAL FIBER

Daniel J. Stigliani, Jr., Poughkeepsie, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 29, 1976, Ser. No. 755,284
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.18 **4 Claims**



1. In an optical fiber of the type having a transparent cladding thereon of a different index of refraction than the fiber core for providing light coupling thereto from the side of said fiber comprising:

an acute angular cut with respect to the center axis of said optical fiber located along at least one end of said optical fiber;

means for rendering the outer surface of said cut reflective;

a light source located adjacent the side of said optical fiber opposite the inner facing surface of said cut such that light reflected from said cut surface will be substantially parallel to and within said optical fiber;

the curved optical fiber cladding material having an index of refraction and curvature so that when located between the light source and said inner surface of said cut end of said optical fiber it acts as a lens to collimate the light emitted from said light source in a plane perpendicular to said center axis.

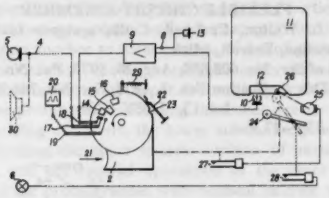
4,092,062

SIGNAL DEVICE FOR ELECTRO-ACOUSTIC REPRODUCING EQUIPMENT

Gerd Kittag, Vienna, Austria, assignor to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed Jun. 18, 1976, Ser. No. 697,483
Claims priority, application Austria, Jun. 18, 1975, 4689/75
Int. Cl.[2] G03B 1/60
U.S. Cl. 352—170 **3 Claims**

1. Apparatus for use with a recording device of the type employing a microphone and an amplifier for signalling the commencement and cessation of a recording operation, comprising: signal generating means, transducer means for converting said signal into an audible sound, and switch means connected to said microphone, said amplifier, said signal generating means, and said transducer means, said switch means having an off position and being sequentially operable from said off position into a first position corresponding to the commencement of the recording operation wherein said signal



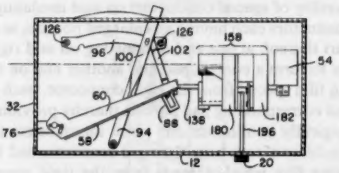
generating means is connected to said transducer means, into a second position corresponding to the recording operation wherein said microphone is connected to said amplifier, into a third position corresponding to the cessation of the recording operation wherein said signal generating means is connected to said transducer means, and into said off position.

4,092,063

FILMSTRIP PROJECTOR

Richard H. Koester, Rochester, N.Y., assignor to The Singer Company, New York, N.Y.

Filed Sep. 20, 1976, Ser. No. 724,881
Int. Cl.[2] G02B 7/02; G03B 21/22, 3/00
U.S. Cl. 353—71 **10 Claims**



1. Projector elements for an image projector enabling selective projection of an image to a remote viewing screen or a local viewing screen comprising:

image projection means mounted on support means for projecting an image along an axis aligned in a horizontal direction;

a shaft rotatably mounted on said support means and rotatable to a first shaft position and a second shaft position about an axis substantially parallel to said projection axis;

a lens carrier mounted on said shaft for rotation therewith and carrying a first objective lens in alignment with a first condensing lens and a second objective lens in alignment with a second condensing lens;

a mirror moveably mounted on said support means and moveable to a first mirror position and a second mirror position about a substantially vertical axis; and

link means coupling said mirror with said shaft whereby movement of said mirror move said link means which in turn rotates said shaft;

said mirror moveable to said first mirror position wherein said mirror intercepts said image axis to reflect said image in a direction substantially perpendicular to said horizontal projection axis, movement of said mirror to said first position moving said link means to in turn rotate said shaft to said first shaft position placing said first objective lens and said first condensing lens in said image axis,

said mirror moveable to said second mirror position wherein said mirror does not intercept said image axis, movement of said mirror to said second position moving said link

means to in turn rotate said shaft to said second shaft position placing said second objective lens and said second condensing lens in said image axis.

4,092,064

PROJECTORS

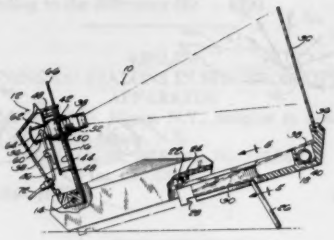
Jean-Pierre Puel, Paris, France, assignor to Realist, Inc., Menomonee Falls, Wis.

Filed Jun. 11, 1976, Ser. No. 695,016

Claims priority, application United Kingdom, Jun. 25, 1975, 26854/75

Int. Cl.[2] G03B *21/24*

U.S. Cl. 353—79 **4 Claims**



1. A projector comprising

a case having an upper surface provided with an aperture therein originating at the rear portion thereof and extending forwardly along the centerline of said surface and having smaller length and width than the surface,

an optical housing pivotally connected to the upper rear portion of the case for movement between an erect position and a folded position in which it is received in and closes said aperture and in conjunction with said upper surface forms the top of the case,

a lens mounted in said housing when the housing is in said erect position and stored in the case when the housing is in folded position,

a projection screen,

means for supporting the screen normal to the projection axis, said means comprising a drawer slidably mounted in the lower portion of the case for movement between a first position in which it forms the bottom of the case and an extended position in which the front of the drawer is positioned substantially in front of the front of the case, and an upwardly opening slot in the front of the drawer to receive said projection screen,

a light source in said housing; and

a power supply for the light source.

4,092,065

SCREEN DRUM TYPE ELECTROGRAPHIC APPARATUS HAVING A CORRECTING LENS TO PRODUCE AN IMAGE OF EQUAL LENGTH AND ASPECT RELATIVE TO THE ORIGINAL

Hiroshi Tsuda, Mitaka; Masaji Nishikawa; Katsuhiko Kimura, both of Hachioji, and Eiichi Sato, Tama, all of Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

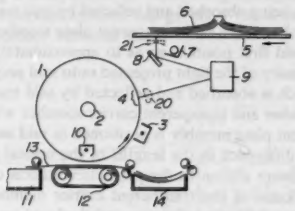
Filed Jul. 23, 1976, Ser. No. 708,264

Claims priority, application Japan, Jul. 29, 1975, 50-92307

Int. Cl.[2] G03G *15/28*

U.S. Cl. 355—8 **3 Claims**

1. In a screen drum type electrographic apparatus comprising a photosensitive screen drum rotated at a constant speed, a flat-shaped record medium opposed to said photosensitive screen drum and fed along a rectilinear passage at a constant speed, a table for disposing a manuscript such as printed matter thereon, and an optical passage including an optical system mounted for relative movement with respect to said table for scanning said manuscript and a projecting lens, the ratio of the peripheral speed of said photosensitive screen drum to the feeding speed of said record medium being defined by 1/K where K is a value greater than 1, whereby a manuscript image is projected through said optical passage onto said screen drum by means of said projecting lens to form an electrostatic picture on said screen drum and a flow of ions directed through said screen drum toward said record medium is modulated by means of said electrostatic picture image formed on said screen drum to form a picture image on said record medium, the



improvement in which said optical passage further comprises a cylindrical lens having a radius of curvature such that an image magnification in the scanning direction only is defined by 1/K, and said cylindrical lens having a length which is sufficient to optically cover the scanning width, the ratio of the peripheral speed of said screen drum to the speed of relative movement of said manuscript table with respect to said optical system being defined by 1/K.

4,092,066

PROJECTION DEVICE FOR USE IN COPYING MACHINE

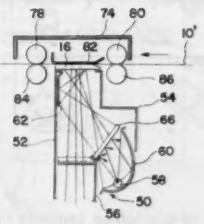
Yoshihisa Kawai, Aichi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Japan

Filed Aug. 17, 1977, Ser. No. 825,458

Claims priority, application Japan, Aug. 25, 1976, 51-101844; Aug. 19, 1976, 51-111478[U]

Int. Cl.[2] G03B *27/54, 27/48*

U.S. Cl. 355—67 **5 Claims**



1. In a photocopying machine capable of copying an original document of a type selected from either one of a thin original document and a thick original document depending on necessity, in which the original document is moved past an exposure station by transport means during an electrophotographic copying process when the original document is a thin one, and said thick original document is carried on a transparent carrier member moving past said exposure station during an electrophotographic copying process when the original document is a thick one, said thick original document being spaced from said exposure station by a distance equal to the thickness of said transparent carrier member, a projection device comprising:

a light source including reflector means for emitting light rays along a first optical path and for illuminating an original document moving past said exposure station, said light rays reflected from the original document being transmitted along a second optical path towards a projec-

tion station where a latent image of the original document is formed; and

a transparent plate member having a predetermined thickness and movable between a first position where the transparent plate member intrudes into said first optical path when said thin original is placed over said exposure station and a second position where the transparent plate member intrudes into said second optical path when said thick original is placed over said exposure station on said transparent carrier member a predetermined amount of light rays being absorbed and refected by said transparent plate member when said transparent plate member is positioned in said first position so as to approximately equalize the intensity of the light projected onto said projection station which is absorbed and reflected by said transparent plate member and transparent carrier member when said transparent plate member is positioned in said second position, the difference in the lengths of the optical path from the exposure station to the projection station caused by said thickness of the transparent carrier member being compensated by the refraction index of said transparent plate member, whereby the projected image of the thick original document on said projection station has brightness and sharpness substantially equal to that of the thin original document.

4,092,067

PRINTING METHOD

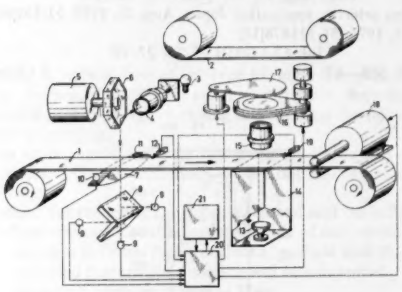
Walter Grossmann, Russikon, Switzerland, assignor to Gretag Aktiengeselischaft, Regensdorf, Switzerland

Filed Aug. 10, 1976, Ser. No. 713,196

Claims priority, application Switzerland, Aug. 14, 1975, 10605/75

Int. Cl.[2] G03B *27/32, 27/74*

U.S. Cl. 355—77 **20 Claims**



1. A method of controlling exposure in the production of photographic prints, comprising scanning an original to be printed point-by-point, determining the neutral density of each picture point of the picture area of said original, dividing up said picture area into a plurality of concentric zones each of which comprises at least two picture points, deriving from the density values of the picture points a first intermediate value representative of the average and/or mean density of the original, determining second intermediate values for each zone from the density values of the picture points in that zone and from the density value in a reference picture point which is the same for all the zones, said second intermediate values being representative of the density contrast between each individual picture point and said reference picture point, weighting said second intermediate values by weighting factors which are associated to each zone and decrease from the innermost zone towards the outermost zone, combining said first and second intermediate values to provide an end value representative of the neutral density of the original and using said end value as input data for controlling density balance when printing said original.

4,092,068

SURFACE SENSOR

John Martin Lucas, and Serge Gracovetsky, both of Montreal, Canada, assignors to Domtar Inc., Montreal, Canada

Filed May 5, 1976, Ser. No. 683,477

Int. Cl.[2] G01N *21/00, 21/18, 21/30*

U.S. Cl. 356—73 **6 Claims**

1. A device for obtaining a continuous indication of the topographic profile of a traveling surface of paper comprising, a light source, means for directing light from said source perpendicularly onto said traveling surface to sequencially illuminate areas of said surface no greater than 1 mm in diameter, at least a pair of detectors symetrically positioned relative to said illuminated areas to receive non-specular light reflected at substantially the same angle to said surface from an instantaneously illuminated area, said angle being in the range of 20° to 60° to said surface, the angle subtended at said illuminated area between said pair of detectors when projected onto said surface being greater than 10°, means for generating a signal from each of said detectors in accordance with the amount of light sensed by said detector, electronic means substantially continuously processing said signals by subtracting one of said signals from the other of said signals from said pair of detectors, to indicate the slope of said surface in said instantaneously illuminated area, thereby to obtain a continuous indication of the topographical profile of said surface while substantially reducing the effects of local differences of reflectivity of the surface.

4,092,069

SPECTROPHOTOMETER

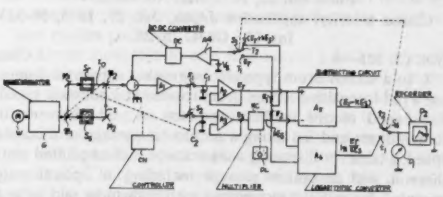
Yoshio Fukuda; Jugoro Suzuki; Toshiaki Fukuma, and Michinosuke Takada, all of Kyoto, Japan, assignors to Shimadzu Seisakusho Ltd., Kyoto, Japan

Filed Jul. 12, 1976, Ser. No. 704,530

Claims priority, application Japan, Jul. 19, 1975, 50-100786

Int. Cl.[2] G01V *3/42;* H01V *39/12*

U.S. Cl. 356—88 **22 Claims**



1. A spectrophotometer comprising: means for providing a

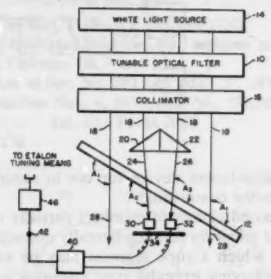
reference and a measuring monochromatic light beams; cell means; optical means for causing said beams to be transmitted through said cell means; first non-logarithmic electrical signal producing means for producing an electrical signal Er corresponding to said reference beam and an electrical signal Es corresponding to said measuring beam; non-logarithmic means for multiplying said electrical signal Es by a predetermined constant or factor k to produce a signal corresponding to the value of kEs, said factor k having a value such that ln (Er/kEs) approaches zero; second non-logarithmic electrical signal producing means for producing an electrical signal corresponding to the sum (Er + kEs); means for controlling said first electrical signal producing means so as to keep the value (Er + kEs) constant; and third non-logarithmic electrical signal producing means for producing an electrical signal corresponding to the difference (Er − kEs).

4,092,070

TUNING OF ETALONS IN SPECTROSCOPIC APPARATUS

Leonard M. Smithline, Ithaca, N.Y., assignor to Lansing Research Corporation, Ithaca, N.Y.

Filed Oct. 26, 1976, Ser. No. 735,586
Int. Cl.² G01B 9/02
U.S. Cl. 356—106 S **4 Claims**



1. The combination of an etalon and apparatus for generating a tuning error signal representative of the misalignment of the center of a passband of etalon from the peak wavenumber of a collimated quasi-monochromatic light beam, said etalon being arranged so that a first fraction of said light beam is incident to said etalon at a first angle; said apparatus comprising,

a. beam deviating means for causing a second fraction of said light beam to be incident to said etalon at a second angle greater than the first angle, and for causing a third fraction of said light beam to be incident to said etalon at a third angle lesser than the first angle; and

b. detection means responsive to said second and third fractions for generating an difference signal representative of the difference between the intensity of the second fraction of said light beam as transmitted through said etalon and the intensity of the third fraction of said light beam as transmitted through said etalon; whereby said difference signal is the desired tuning error signal.

4,092,071

PHOTOELECTRIC DETERMINATION OF THE CUT-OFF OF A LIGHT BEAM FROM A MOTOR VEHICLE HEADLAMP

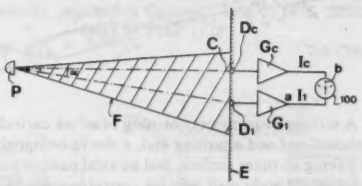
Olivier Puyplat, Paris, France, assignor to Cibie Projecteurs, Bobigny, France

Filed Mar. 18, 1976, Ser. No. 668,170
Claims priority, application France, Apr. 1, 1975, 75 10095
Int. Cl.² G01J 1/00
U.S. Cl. 356—121 **8 Claims**

1. A method of adjusting the vertical position of the cut-off plane of a motor vehicle headlamp, comprising the steps of:

(a) providing an upper light detection system and a lower light detection system, each light detection system including a photosensitive device, the photosensitive devices being vertically spaced apart a fixed distance, and each light detection system providing a signal representative of the intensity of light impinging upon it, the value of the signals produced by the two light detection systems in response to the same intensity light impinging upon them differing from each other by a fixed ratio substantially unequal to one,

(b) providing a comparator for comparing the signals from the light detection systems and giving a visual indication of the difference between them,



(c) arranging a headlamp at a predetermined horizontal distance from at least one of the photosensitive devices and directing light from the headlamp at the devices,

(d) moving the photosensitive devices and the headlamp in a vertical direction relative to each other, and

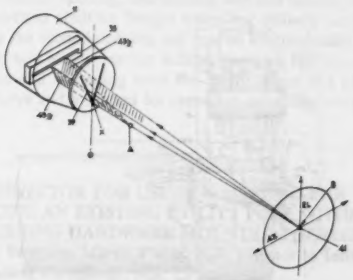
(e) stopping the movement when the comparator indicates a difference of a particular predetermined value, that predetermined value being achieved only when the cut-off plane of the headlamp intersects the upper photosensitive device.

4,092,072

OPTICAL SENSORS

Stafford Malcolm Ellis, Maidstone, England, assignor to Elliott Brothers (London) Limited, Chelmsford, England

Filed Aug. 2, 1976, Ser. No. 710,619
Claims priority, application United Kingdom, Aug. 28, 1975, 35518/75
Int. Cl.² G01B 11/26
U.S. Cl. 356—152 **7 Claims**



2. A sensor for use in apparatus for determining angular position, the sensor having a housing, an aperture in the form of two mutually inclined slits, and a linear array of discrete light-sensitive elements producing discrete outputs; wherein the aperture is formed in the housing and is operative simultaneously to develop two laminar light beams in response to light from a small light source, the linear array of light-sensitive elements is contained within the housing, is spaced from said mutually inclined slits, and so orientated that said laminar light beams developed by the aperture impinge on the array at

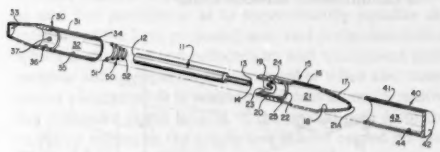
positions dependent on the angular position of the light source with respect to the sensor in two orthogonal axes.

4,092,073

WRITING INSTRUMENT WITH BAYONET LOCK

Olof Verner Anderson, North Kingstown, R.I., assignor to Anson Incorporated, Providence, R.I.

Filed Nov. 15, 1976, Ser. No. 742,005
Int. Cl.[2] B43K *7/00*
U.S. Cl. 401—209 **2 Claims**



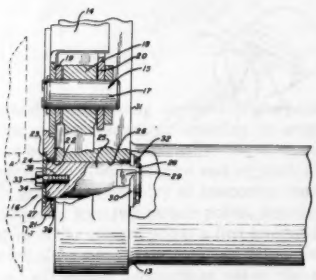
1. A writing instrument consisting of an ink cartridge having an inboard end and a writing end, a sleeve comprising a body wall having an outer surface, and an axial passageway, a bayonet slot in said body wall, said ink cartridge partially located in said axial passageway with said writing end projecting beyond said body wall, a hollow cap provided with an inner wall forming a chamber closed on one end by a back wall, a projection in said inner wall, said inner wall slidably engaging said outer surface with said cartridge partially located in said chamber, spring means interposed between said back wall and said inboard end (,) to provide resilient pressure on said writing end in writing position, means retaining said ink cartridge in said axial passageway under pressure of said spring means, said projection slidably engaging said bayonet slot under pressure from said spring means, and a cover having an inner surface providing a cavity, said inner surface slidably engaging said outer surface, to locate said writing point within said cavity.

4,092,074

RADIATOR GUARD HINGE PIN

Robert W. Harper, Metamora, and Robert L. Shelby, Chillicothe, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 11, 1977, Ser. No. 814,373
Int. Cl.[2] F16C *11/10*
U.S. Cl. 403—24 **12 Claims**



1. In a machine having a support, a cover, and mounting means movably mounting the cover to the support for selective disposition in a covering position overlying said support and an exposing position, improved means for releasably locking the cover to the support in said covering position comprising:

a locking pin defining inner and outer ends;

means on said support defining a hole axially movably receiving said locking pin;

means on said cover defining an opening aligned with said hole when said cover is in said covering position; and

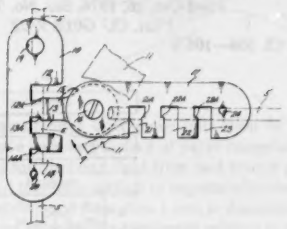
positioning means carried by said support for selectively urging said locking pin axially outwardly to dispose said locking pin outer end in said opening while maintaining said locking pin inner end in said hole to prevent movement of said cover from said covering position, said outer end of the pin being accessible through said opening upon removal of said positioning means to permit urging of said locking pin axially inwardly to dispose said inner end inwardly of said cover thereby freeing said cover for movement on said mounting means to said exposing position.

4,092,075

LINE ATTACHMENT DEVICE

James F. Kimball, Star Rte. 2, Box 466, Dexter, Oreg. 97431

Filed May 13, 1976, Ser. No. 686,168
Int. Cl.[2] F16C *11/00*; F16G *11/00*
U.S. Cl. 403—72 **2 Claims**



1. A line attachment device for use in securing tie-down ropes, said device comprising,

first and second elongated members partially overlapped;

each of said members defining laterally extending inset areas through which a rope segment may be entrained, said members having irregular rope engaging edges partially defining said inset areas for embedded engagement with an entrained rope segment, and

said first member including an arm at substantially a midportion thereof and providing a supporting surface for the said second member, and

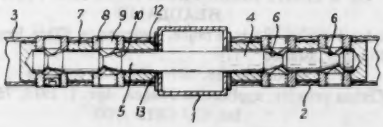
pivot means extending perpendicularly through and interconnecting an end of said second member to the overlapped arm whereby said members may freely pivot to accommodate a wide range of angular relationships between the attached rope segments, said pivot means being detachable from said members permitting individual use of a member to secure an entrained rope segment.

4,092,076

ASSEMBLY SYSTEM FOR FRAMES

Fernand Scherrer, 4 Rue de la Hardt, Kembs, France (68680)

Filed May 26, 1976, Ser. No. 690,270
Claims priority, application France, May 26, 1975, 75 16283
Int. Cl.[2] F16D *1/00*
U.S. Cl. 403—178 **11 Claims**



1. An assembly system for mounting a first beam to a central beam of polygonal cross-section comprising:

a said first beam extending from said central beam and to be connected thereto with the end of the first beam to be supported by a plane face of said central beam,

a peg extending from a face of said central beam, the extending portion of said peg having a conical tapered bearing surface extending around the periphery of the peg,

an axial bore extending to an end of said first beam for receiving the extending portion of said peg having the bearing surface thereon,

peg engaging means comprising:

(a) a pair of bores formed through the surface of said first beam transverse to its longitudinal axis and extending into the area of said bore to be occupied by the tapered bearing surface of said peg, said bores of said pair being substantially diametrically opposed,

(b) tube means mounted on said first beam and extending into each of said bores of said pair of bores, said tube means having means for receiving a screw,

(c) and a screw having a conical end in a respective screw receiving means of a corresponding tube means, said concial end of each said screw engaging the tapered bearing surface of said peg to draw the end of said lateral beam into which the peg extends toward the corresponding face of said central beam to be supported thereby as the screws are tightened.

4,092,077

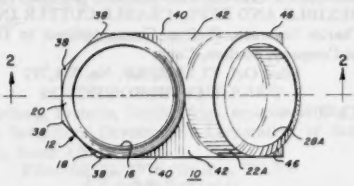
STRUCTURAL CONNECTOR

Henry Howard George, Louisville, Ky., assignor to Chemetron Corporation, Chicago, Ill.

Continuation of Ser. No. 581,135, May 27, 1975. This application Nov. 4, 1976, Ser. No. 739,006

Int. Cl.[2] F16D *1/00*

U.S. Cl. 403—178 **7 Claims**



1. A forged steel structural connector for tubular members in a truss, comprising:

a one-piece forged steel element having a body member of approximately uniform wall thickness constituting at least a curved portion of a tubular primary member having a longitudinal central axis, and first and second tubular secondary members;

each of said secondary members having a longitudinal central axis coplanar with said axis of said primary member and each being integrally connected to said body member by forging said secondary members to a first side of said primary member and to each other to provide an overlapping joint between said secondary members and to provide a web having a wall thickness greater than said approximately uniform thickness of said body member, said web being formed by said forging and extending outwarding from said primary member and between said secondary members;

said primary member having a second side, the distance between said first and second sides of said primary member defining the thickness thereof where said primary member is connected to said secondary members, said thickness being greater than said approximately uniform thickness of said body member and being caused by the forging of said body member;

said axes of said secondary members intersecting each other at a point between said axis of said primary member and said first side of said primary member to provide a joint of negative eccentricity between said secondary members and said primary member, the distance between said axis of said primary member and said point of intersection being greater than the distance between said point of intersection and said second side of said primary member.

4,092,078

ELASTIC CONNECTION FOR AN AXIAL JOINT WITH CONNECTING LINKAGE OF A MOTOR VEHICLE STEERING GEAR

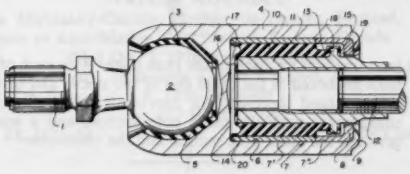
Werner Klotz, Diepholz, and Georg Kindel, Lemforde, both of Germany, assignors to Lemförder Metallwaren AG, Lemforde, Germany

Filed Mar. 10, 1977, Ser. No. 776,177

Claims priority, application Germany, Dec. 7, 1976, 2655353

Int. Cl.[2] F16F *1/38*

U.S. Cl. 403—221 **5 Claims**



1. An elastic connection of an axial joint with the connecting linkage of a motor vehicle steering gear, comprising a joint housing having first and second end walls, a ball socket cavity defined in said housing adjacent said first end wall and having an opening in said first end wall for accommodating the axial joint, a connecting linkage bearing cavity defined in said housing in longitudinally spaced relationship to said ball-socket cavity and having an opening in said second end wall, said housing having a partition wall between said ball-socket cavity and said connecting linkage bearing cavity, a bearing sleeve in said connecting linkage bearing cavity, a linkage sleeve located within and spaced readially inwardly from said bearing sleeve in said connecting linkage bearing cavity, said bearing sleeve having an inner end bearing against said partition wall, an elastic bearing bushing disposed between said bearing sleeve and said linkage sleeve and firmly secured at its inner periphery to said linkage sleeve and its outer periphery to said bearing sleeve, said linkage sleeve having an annular collar projecting radially outwardly therefrom adjacent to, but spaced inwardly from, the second opening, said housing and said bearing sleeve having inturned abutting flanges extending radially inwardly abounding the second opening and spaced longitudinally from said collar, said elastic bearing bushing having a first lip extension at one end extending over the axially inner end of said linkage sleeve and a second lip extension extending over said collar.

4,092,079

CONNECTOR FOR USE IN A METHOD FOR REPLACING AN EXISTING UTILITY POLE WITHOUT DISTURBING HARDWARE MOUNTED THEREON

Harold V. Swanson, Morris Plains, N.J., assignor to Interpace Corporation, Parsippany, N.J.

Filed Dec. 2, 1975, Ser. No. 636,914

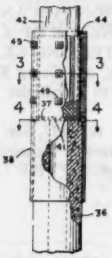
Int. Cl.[2] F16B *7/04*

U.S. Cl. 403—306 **9 Claims**

1. In combination a connector fixedly mounted on a cylindrical new prestressed concrete utility pole section, the connector and new pole section being joinable to a severed distal section of an erected generally cylindrical wooden utility pole, without disturbing hardware mounted on the erected pole section, with a lower end of the distal pole section positionable in axially aligned abutment on an upper end of the new pole section, the connector comprising:

a tubular sleeve having a distal sleeve end projecting beyond the prestressed concrete upper end of the new pole section to present a socket for receiving the lower end of the wooden distal pole section therein,

a plurality of arcuate push plates in the socket and surrounding the lower end of the distal pole section,



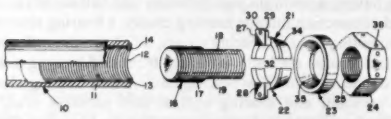
at least one bolt for each of the push plates with each of the bolts anchored in the distal end of the sleeve and threadably engaged therewith for moving its push plate into engagement with the distal pole section, and a sealant between the distal pole section and the connector.

4,092,080

ANTI-ROTATION LOCK FOR THREADED CONNECTION

Charles Duane Bradley, Jr., Gobles, Mich., assignor to Pneumo Corporation, Boston, Mass.

Filed Jun. 3, 1976, Ser. No. 692,450
Int. Cl.[2] F16B *39/36*
U.S. Cl. 403—319 **15 Claims**



1. An anti-rotation lock between an internally threaded female member and an externally threaded male member comprising a notch in the end face of said female member, a flat on said male member, a locking member having a projection adapted to fit into said notch and a flat adapted to mate with the flat on said male member, and means to force said locking member both axially and radially in turn to force said projection into said notch and the flat of said locking member against the flat on said male member, said means to force said locking member both axially and radially comprising an axially movable loading member, and cooperating surfaces on said locking member and loading member to produce both axial and radial force vectors from the axial movement of said loading member, said locking member comprising a pair of semi-circular keys, each having an external semi-circular wedge surface, and said loading member comprising a ring having an internal wedge surface cooperating with the wedge surfaces of said keys.

4,092,081

ROADWAY/TRAFFIC DELINEATOR

Donald W. Schmanski, Carson City, Nev., assignor to HPC, Inc., Carson City, Nev.

Filed Jul. 5, 1977, Ser. No. 812,643
Int. Cl.[2] E01F *9/00*
U.S. Cl. 404—10 **26 Claims**

1. A delineator having concurrent characteristics of a sufficiently high modulus of elasticity for withstanding buckling loads applied during static conditions along its longitudinal axis during installation and a sufficiently low moment of inertia to establish elastic character in an exposed section of said delineator to permit nondestructive deformation upon impact by a moving object and subsequent immediate restoration to an original, upright orientation, said delineator including:

an elongate web structure comprising a combination of random and longitudinally oriented fibers imbedded in 20

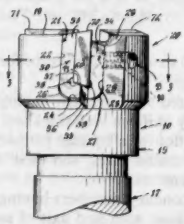
to 40% (w) resin binder, said fiber combination being comprised of at least 7% but not more than 60% fiber in random arrangement to provide transverse flexibility and tensile strength, and said longitudinal orientation of fiber comprising the remaining percentage of total fiber content to provide longitudinal rigidity during said static conditions.

4,092,082

METAL CUTTING TOOL WITH ANVIL-HELD INDEXIBLE AND REPLACEABLE CUTTER INSERTS

Ole Charles Severson, Shelton, Conn., assignor to The Viking Tool Company, Shelton, Conn.

Filed Oct. 12, 1976, Ser. No. 731,792
Int. Cl.[2] B26D *1/12*
U.S. Cl. 407—40 **13 Claims**



1. A metal cutting tool comprising:

(A) a tool body including a shank and a generally cylindrical tool head having top and circumferential surfaces, said tool head defining at least one generally radially extending slot open along the top and circumferential surfaces of said tool head;

(B) a U-shaped anvil having two legs connected by a base, said U-shaped anvil matingly received in the slot defined by said tool head;

(C) a replaceable cutter insert received between the legs of said U-shaped anvil, a portion of said cutter insert butting against said U-shaped anvil and a portion of said cutter insert butting against said tool head thereby positioning said cutter insert with respect to said tool head; and

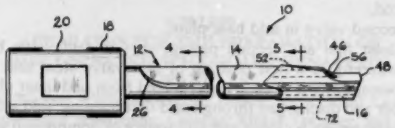
(D) means releasably clamping said cutter insert between the legs of said U-shaped anvil and holding said U-shaped anvil and cutter insert in the slot defined by said tool head.

4,092,083

GUN DRILL

George A. Larry, Farmington, Mich., assignor to Star Cutter Company, Farmington, Mich.

Filed Feb. 15, 1977, Ser. No. 768,686
Int. Cl.[2] B23B 51/06
U.S. Cl. 408—59 5 Claims



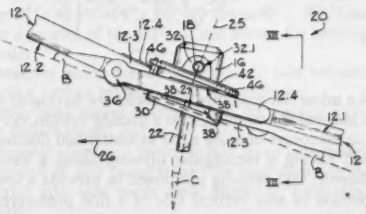
1. A gun drill comprising a generally cylindrical body having a shank portion and a tip portion, said body having a longitudinally extending groove formed in the outer surface thereof extending the full length of said tip portion, the side walls of said groove in said tip portion being angularly related, the terminal end of said tip portion having a single cutting edge extending substantially radially thereof from one side surface thereof through the axis of said tip portion and terminating in a spaced relation with a diametrically opposite side surface thereof, said tip portion being formed intermediate the ends thereof with a wall section located to one side of said groove and in alignment with said cutting edge in a direction longitudinally of said body, and means forming a fluid passage in said body terminating at said wall section in an orifice positioned so that when fluid is supplied to said passage, said fluid is discharged from said orifice in a direction toward said cutting edge, said tip portion having a surface inclined axially of said drill and extending from said wall portion at a location radially outwardly of said orifice toward said shank portion, said surface and said cutting edge being located relative to said orifice so that said orifice is disposed between said surface and said cutting edge.

4,092,084

ROTOR FOR AN AUTOGIRO

Austin Barltrop, Pretoria, South Africa, assignor to The South African Inventions Development Corporation of Scientia, Pretoria, South Africa

Filed Jul. 22, 1976, Ser. No. 707,758
Int. Cl.[2] B64C 27/44
U.S. Cl. 416—102 13 Claims



1. A rotor for an autogiro of the type having a two-bladed semi-rigid tilt hub teetering arrangement, the rotor comprising:

(a) a hub for rotatable mounting on an autogiro about an upwardly extending axis;

(b) A bracket pivotally connected to the hub about a teeter axis normal to the axis of rotation of the hub, the bracket being capable of teetering about said teeter axis during rotation of the hub about its axis of rotation;

(c) A pair of diameterically spaced and radially oppositely outwardly extending semi-rigid blades each fast with the bracket;

(d) at least one pivotal connection between at least part of each blade and the bracket, to permit simultaneous pivoting of each of said parts of the blades relative to the bracket to increase the coning angle of the rotor and simultaneously to increase the blade angles of the blades or to decrease the coning angle of the rotor and simultaneously to decrease the blade angles of the blades; and

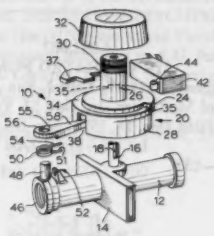
(e) stop formations fixed to the bracket on opposite sides of the pivotable blade parts for abutment against said parts to determine the extreme positions of said parts between which they are pivotable, namely first stop formations defining first extreme positions for the blade parts, corresponding to their rest or spin-up condition, and second stop formations defining second extreme positions for the blade parts, corresponding to their flight condition, in which their blade angle and the coning angle of the rotor are greater than the blade angle and coning angle respectively in the first extreme position.

4,092,085

FAUCET ASSEMBLY

Colin McMaster-Christie, Sunbury-on-Thames, England, assignor to Aqua-Marine Mfg. Limited, Toronto, Canada

Filed Oct. 7, 1976, Ser. No. 730,688
Claims priority, application United Kingdom, Oct. 7, 1975, 41082/75; France, Jan. 8, 1976, 76 00361
Int. Cl.[2] F04B 49/06
U.S. Cl. 417—44 29 Claims



1. A faucet assembly comprising:

structure defining a fluid passageway,

valve means adapted to close and open said fluid passageway,

a shaft adapted on rotation to operate said valve means,

and (resilient biasing means to induce the shaft to rotate) pivoted biased probe means for interacting with a recess which rotates with said shaft to positively rotate the shaft in the direction closing the valve means whenever the shaft is less than a given angle away from its position corresponding to full closure of the valve means, said given angle corresponding to a condition in which the passageway is at least partly opened, and being less than the full rotational range for the shaft.

4,092,086

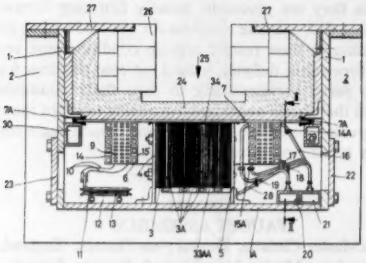
ELECTROMAGNETIC CONVEYER TROUGH FOR THE CONVEYANCE OF MOLTEN METALS

Axel von Starck, Remscheid, and Hans-Erwin Gerbig, Huckeswagen-Wiehagen, both of Germany, assignors to AEG-Elotherm, G.m.b.H., Remscheid-Hasten, Germany

Filed Mar. 17, 1977, Ser. No. 778,582
Claims priority, application Germany, May 14, 1976, 2621636
Int. Cl.[2] H02K 45/00; H02N 4/20
U.S. Cl. 417—50 6 Claims

1. In an electromagnetic conveying trough for conveying molten metals with a trough body extending in the direction of conveyance and lined with a fire-resistant lining, an inductor extending in the trough body along the direction of conveyance for producing a travelling electromagnetic field, said inductor including a grooved, laminated package with the grooves running transverse to the direction of conveyance and

defining teeth, a coil winding disposed about each of said teeth and adapted for connection to a source of electrical potential, and coolant pipe lines extending in said grooves, the improvement wherein said pipe lines extend coaxially with respect to each said winding so as to form a separate and distinct unit



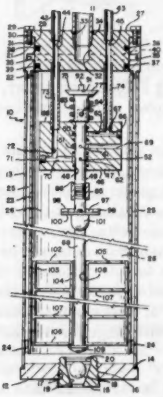
with said winding, and wherein said electromagnetic conveying trough comprises coolant supply and discharge means for individually supplying coolant to said pipe lines in each of said separate and distinct units so that each of said units operates and may be replaced independently of the other of said units.

4,092,087

AIR OPERATED PUMP

David S. Anthony, 1235 W. Laurel, San Antonio, Tex. 78201, and Leonard M. Turner, Jr., Box 52, Von Ormy, Tex. 78073

Filed Dec. 14, 1976, Ser. No. 750,445
Int. Cl.[2] F04F *1/08*
U.S. Cl. 417—131 **11 Claims**



1. A pump adapted to be lowered into a fluid producing formation in a well bore with a source of compressed gas applied thereto comprising

an elongated hollow cylindrical casing secured downwardly to a base plate and upwardly to an annular ring,

a cylindrical inner casing secured upwardly to said ring and terminating downwardly at least slightly above said base plate,

a hollow annular outer chamber formed intermediate said outer and inner casings,

a cap secured to said ring, first and second openings in said cap communicating respectively with atmosphere and said source of compressed gas,

an inner cylindrical chamber formed inwardly of said inner casing,

a continuous passageway in said cap and annular ring communicating with said outer chamber,

a valve in said inner chamber commucating with said first and second openings,

said valve comprising a valve body and a valve stem reciprocally mounted therein,

an elongated rod connected to said valve stem,

a float reciprocally mounted in said inner chamber on said rod,

a second valve in said base plate,

at least first and second passageways in said valve body whereby in a first position of said valve stem said first passageway is open and gas is bled from said inner chamber and discharged through said first opening, said second passageway is closed and said source of compressed gas is cut off, and said fluid is adapted to enter said second valve into said pump,

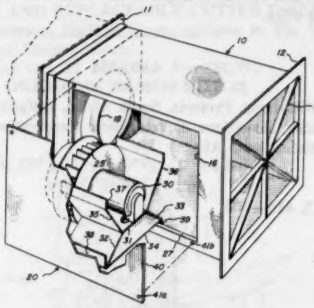
said float adapted to rise to a predetermined height in said inner chamber and move said valve stem to a second position at which time said first passageway is closed, said source of compressed gas is applied through said second opening and second passageway to said inner chamber, said second valve in said base plate is closed, and said fluid forced upwardly through said outer chamber and said continuous passageway to a selected portion of said cap.

4,092,088

CENTRIFUGAL FAN ENCLOSURE

Steve A. Nemesi, Minnetonka, Minn., assignor to General Resource Corp., Minneapolis, Minn.

Filed Jan. 7, 1977, Ser. No. 757,597
Int. Cl.[2] F04B *17/00*
U.S. Cl. 417—360 **9 Claims**



1. An inline fan assembly and enclosure having an inlet and outlet adapted for coupling into a ducting system, comprising:

(a) an enclosure housing sized to match said ducting system and having a rectangular opening along a vertical side thereof, said opening positioned to provide a lower edge portion of said vertical side of a first predetermined dimension;

(b) a door plate sized larger than said rectangular opening and having means for attachment to said enclosure vertical side in closure relationship to said rectangular opening;

(c) a base support bracket having one of its ends extending into said enclosure and having an opposite end rigidly attached to said door plate at a position so as to rest said opposite end along said enclosure rectangular opening lower edge when said door plate is attached in closure relationship to said rectangular opening;

(d) U-shaped channel means for pivotally supporting said inline fan assembly about said enclosure housing lower edge portion, said U-shaped channel means being attached to said base support bracket end extending into said enclosure; and

(e) a motor and fan mounting bracket attached to said base support bracket; and

(f) a motor and fan assembly attached to said motor and fan mounting bracket in a position which places said fan in flow alignment with said enclosure inlet when said door plate is attached in closure relationship to said rectangular opening.

4,092,089

APPARATUS FOR THE PREPARATION OF MELT-SPRAYED SPHERICAL PHENACETIN GRANULES

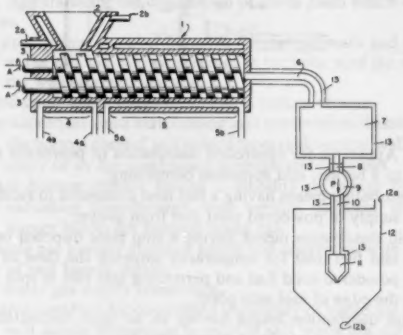
Ernst Böcker; Wolfgang Kracht; Roland Rupp, all of Leverkusen; Erhard Schellmann, Cologne; Viktor Trescher, and Martin Ullrich, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 635,607, Nov. 26, 1975, abandoned, which is a division of Ser. No. 564,169, Apr. 1, 1975, abandoned. This application May 19, 1977, Ser. No. 798,447

Claims priority, application Germany, Apr. 6, 1974, 2416904

Int. Cl.² B29C *23/00*

U.S. Cl. 425—10 **5 Claims**



1. Apparatus for melt-spraying a material that is thermally sensitive in the molten state and has a melt viscosity of from about 0.5 to about 500 cp., which comprises

(a) a multi-screw extruder for melting said material comprising intermeshing, self-cleaning screws having a clearance between the intermeshing screw shafts and a clearance between the screws and the housing of the extruder in the range of from about 4×10^{-3} to about 30×10^{-3} times the outer diameter of the screws, and means for heating said extruder;

(b) a heatable pump means connected to said extruder for pumping molten material from said extruder;

(c) a spray tank means having means for passing a cooling fluid therethrough; and

(d) a heatable atomizing means in said spray tank means and connected to said pump means for melt-spraying molten material into said spray tank means to form granules thereof;

(e) said pump means being operable to pump molten material from said extruder to said atomizing means, and said spray tank means being operable to solidify the atomized material therein.

4,092,090

TIRE CURING SYSTEM

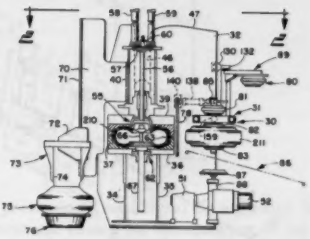
Gerald Joseph Yuhas, Canfield, and Leonard G. Turk, Aurora, both of Ohio, assignors to NRM Corporation, Akron, Ohio

Filed May 18, 1977, Ser. No. 797,938

Int. Cl.² B29H *5/02, 17/00, 21/00*

U.S. Cl. 425—28 P **29 Claims**

1. A tire curing system comprising a press and a separable rim post inflator, said press including a bottom and movable top mold, the latter being movable laterally between said bottom mold and at least one of said separable rims of said post inflator, a stripping chuck in said top mold for holding the tire after stripping from the molds for movement with the movable



top mold, and means to lower said chuck while holding the tire when the movable top mold and post inflator rim are vertically aligned to place the tire in the post inflator without any lateral momentum.

4,092,091

APPARATUS FOR MAKING A TOOL ELECTRODE FOR ELECTRICAL DISCHARGE MACHINING

Günther Peddinghaus; Harry Neumann, and Horst Wittenstein, all of Ennepetal, Germany, assignors to A.G. fur Industrielle Elektronik AGIE b. Locarno, Losone, Switzerland

Division of Ser. No. 620,304, Oct. 7, 1975, Pat. No. 4,051,747. This application May 12, 1977, Ser. No. 796,450

Claims priority, application Germany, Oct. 8, 1974, 2447842; Switzerland, Sep. 26, 1975, 12483/75

Int. Cl.² B29C *5/00*

U.S. Cl. 425—62 **8 Claims**

1. Casting apparatus for use in making a tool electrode for electrical discharge machining, the apparatus comprising a base plate (**11**), mounted on a travelling subbase (**10**) with at least two guides (**13**) disposed on said base plate; a second plate (**12**) being guided on said guides parallel to the base plate (**11**); a casting box (**20**) between said base plate (**11**) and said second plate (**12**); an adjusting device (**16**) for controlling the displacement of the second plate (**12**) parallel to the base plate (**11**), at least three adjusting devices (**14**) for adjustment of the parallel position of the base plate (**11**) with respect to the second plate (**12**); the arrangement, on each of the two plates (**11, 12**), of two centering trunnions (**15**) for alignment of the position of interchangeable pallettes (**18**) on which the castings (**2**), (**3***a*), (**4**), (**4***a*), (**5**), (**5***a*), (**7**) are cast.

4,092,092

APPARATUS FOR MAKING CERAMIC ARTICLES

Homer S. Dye, and Lloyd V. Hamner, both of Hacienda Heights, Calif., assignors to Pacific Clay Products, Santa Fe Springs, Calif.

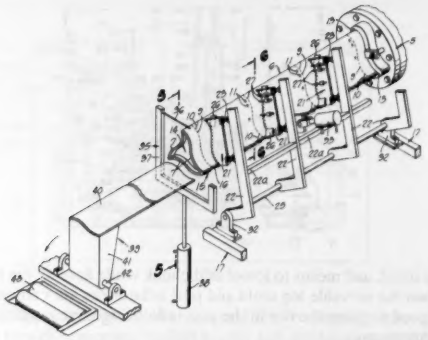
Filed Jul. 16, 1976, Ser. No. 705,803

Int. Cl.² B29D *23/04*

U.S. Cl. 425—291 **6 Claims**

1. Apparatus for forming clay products for kiln treatment, comprising: an intermittently operable die for forming a tubular extrusion of clay material, and including means operatively associated with said die for scoring the tubular extrusion longitudinally along peripherally spaced lines; a core conforming to the internal configuration of the tubular extrusion positioned to

receive and support the tubular extrusion from said die; a plurality of scoring blades disposed around the core for essentially radial movement into the tubular extrusion to produce peripheral scores in the surrounding tubular extrusion between the longitudinal scores thereby dividing the tubular extrusion



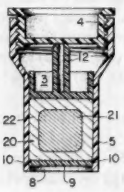
into a plurality of clay products for separation after kiln treatment; means downstream of said scoring blades for severing a preselected length of the tubular extrusion; and a series of platens disposed under the core to support the underlying portion of the tubular extrusion, the platens being separated to clear scoring blades underlying the core.

4,092,093

APPARATUS FOR DEFORMING BOILED EGG

Masashi Nakagawa, Fukuyama, Japan, assignor to Kabushiki Kaisha Aiki Shoji, Fukuyama, Japan

Filed Jun. 16, 1976, Ser. No. 696,846
Int. Cl.[2] A23P *1/00*
U.S. Cl. 425—398 **10 Claims**



1. An apparatus for deforming a boiled egg, comprising:

a chamber defining a tubular space of a desired configuration;

means positioned to close one end of said tubular space;

smoothly inclined portion extending continuously from the top edges of the other end of said tubular space and having a progressively enlarged cross section as it goes farther from the top edges of said tubular space, said cross section of the inclined portion being larger than the cross section of the tubular space;

a pressing member having a pressing surface with a shape substantially identical with the cross section of said tubular space; and

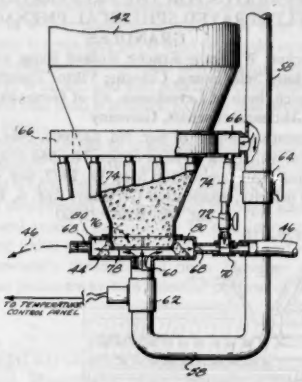
means operable to move said pressing member within said chamber.

4,092,094

METHOD AND APPARATUS FOR THE CONTROLLED DISTRIBUTION OF POWDERED SOLID FUEL TO BURNING UNITS

Hans Lingl, Jr., Paris, Tenn., assignor to Lingl Corporation, Paris, Tenn.

Filed Feb. 25, 1977, Ser. No. 772,238
Int. Cl.[2] F23K *3/02*
U.S. Cl. 432—1 **75 Claims**



1. Apparatus for controlled distribution of powdered solid fuel to a burner, said apparatus comprising:

distribution means having a fuel inlet connected to receive a supply of powdered solid fuel from above;

said distribution means having a stop plate disposed below said fuel inlet for temporarily stopping the flow of said powdered solid fuel and permitting said fuel to spill over the edge of said stop plate;

said distribution means having an air inlet connected for receiving a supply of compressed air;

said distribution means having an outlet disposed adjacent the area where fuel spills over the edge of said stop plate and adapted for connection to said burner;

said distribution means being constructed so as to define an air space between said spilled fuel and said outlet;

said distribution means, said fuel inlet, said stop plate, said air inlet and said outlet being constructed relative to one another so as to cause the powdered solid fuel entering through the fuel inlet to pass downwardly and spill over the edge of said stop plate into the vicinity of said air space where it mixes with an air current and is positively blown into and through said outlet at a rate dependent upon the rate at which compressed air is supplied to said air inlet; and

control means connected for controlling the supply of compressed air to said air inlet.

65. Method for controlled distribution of powdered solid fuel to a plurality of burners, said method comprising the steps of:

accumulating a supply of powdered solid fuel in a storage container;

gravity feeding said powdered solid fuel from said storage container downwardly over the edges of a stop plate and directly into air spaces where the fuel is mixed with air and conveyed along the paths of plural air streams moving towards and through corresponding said air spaces and plural outlet openings connected to supply respectively corresponding ones of said burners; and

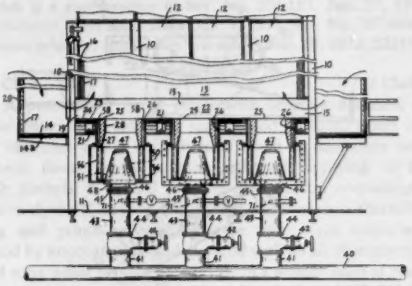
controlling the timing and rate at which air is supplied to said air streams and thereby controlling the times and rate at which powdered solid fuel is distributed to said burners.

4,092,095

COMBUSTOR FOR WASTE GASES

John F. Straitz, III, Meadowbrook, Pa., assignor to Combustion Unlimited Incorporated, Elkins Park, Pa.

Filed Mar. 18, 1977, Ser. No. 779,047
Int. Cl.[2] F23C 7/04
U.S. Cl. 431—114 10 Claims



1. Apparatus for the combustion of waste gases which comprises,

a combustion chamber bounded by vertical walls and open at the top and having openings at the bottom of the vertical walls for entry of air,

said combustion chamber having a bottom closure,

an acoustical fence surrounding said combustion chamber at the bottom thereof and spaced from said vertical walls for entry of air for combustion through said openings,

said bottom closure having a plurality of burner blocks extending therethrough with vertical openings in the burner blocks for burning waste gas,

waste gas burners disposed below and concentric with each of said burner blocks,

a waste gas supply connection,

valve members for controlling the supply of waste gas from said supply connection to each of said waste gas burners,

a supply connection for air under pressure,

branch ducts for each of said waste gas burners connected to said air supply connection for supplying primary air for combustion to each of said waste gas burners,

members for controlling the flow through each of said ducts,

each of said waste gas burners being removably mounted with respect to its burner block and its branch duct for inspection and cleaning.

4,092,096

BATTERY OPERATED LIGHTER EQUIPPED WITH A DIGITAL TIMEPIECE

Kenjiro Goto, Urawa, Japan, assignor to Mansei Kogyo Kabushiki Kaisha, Saitama, Japan

Filed Dec. 27, 1976, Ser. No. 754,002
Claims priority, application Japan, Dec. 27, 1975, 50-158059
Int. Cl.[2] F23Q 2/32
U.S. Cl. 431—253 11 Claims

1. A battery operated lighter equipped with a digital timepiece comprising:

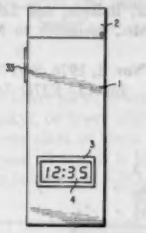
a casing;

digital time display means in the casing;

ignition circuit means housed in the casing for generating an electric spark to ignite a lighter fuel;

timepiece circuit means housed in the casing and electrically connected to the ignition circuit means for operating the digital time display means;

a battery arranged within the casing to energize the ignition circuit means and the timepiece circuit means;



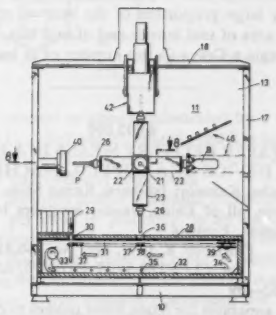
means for preventing a noise signal having a high frequency component and caused by the operation of the ignition circuit means from affecting the timepiece circuit means.

4,092,097

APPARATUS FOR BLOW-MOLDING HOLLOW ARTICLES, IN PARTICULAR BOTTLES

Adolf Appel, Egestorf-Nordheide, and Wolfgang Reymann, Hamburg, both of Germany, assignors to Gildemeister Corpoplast GmbH

Filed Oct. 1, 1976, Ser. No. 728,810
Claims priority, application Germany, Oct. 8, 1975, 2545132
Int. Cl.[2] F27D 3/00
U.S. Cl. 432—11 7 Claims



5. In a method of heating and transferring parisons during a blow molding operation, the steps of:

(1) freely suspending open-topped parisons from an overhead support,

(2) intermittently advancing the suspended parisons through a heating oven into successive alignment with an overhead discharge opening,

(3) during such advancement heating the parisons,

(4) vertically extending a transfer arm through said opening into the open top of that heated parison aligned with said opening,

(5) frictionally engaging the transfer arm with only the interior of said heated parison,

(6) vertically retracting through said opening the transfer arm with the parison engaged thereby, and

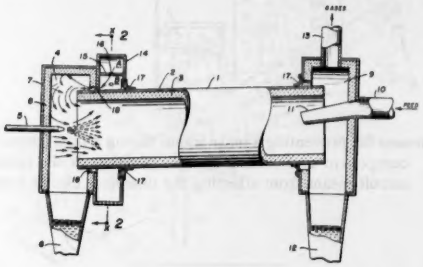
(7) arcuately moving said retracted transfer arm and said parison toward a blow molding station.

4,092,098

METHOD AND APPARATUS FOR IMPROVED IN SITU COMBUSTION OF PYROLYSIS GASES IN A KILN

Donald E. Honaker, Ballwin, and Louis J. Jacobs, Jr., Des Peres, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 1, 1976, Ser. No. 737,745
Int. Cl.[2] F27D 7/00
U.S. Cl. 432—19 11 Claims



1. In a process for pyrolysis of a carbonaceous material in a direct-fired rotary kiln wherein at least a portion of the thermal energy required for pyrolysis is obtained by the in situ combustion of the pyrolysis gases generated within the kiln with controlled quantities of an oxygen-containing gas admitted at the burner end of the kiln, said carbonaceous material undergoing pyrolysis being fed into the kiln at one end of the kiln and flowing toward the burner end of the kiln counter-current to the flow of the gaseous matter in the kiln, the improvement which comprises:

(a) controlling the velocity of any burner combustion gases and the velocity of said oxygen-containing gas within the burner end of the kiln, and

(b) distributing said oxygen-containing gas over a sufficiently large proportion of the internal radial cross-sectional area of said burner end of said kiln,

so as to obtain a Craya-Curtet number of at least 0.2.

4,092,099

COPIER PAPER DELIVERY MEANS IN A HEAT-FIXING DEVICE OF A COPYING MACHINE

Satoshi Chiba; Kazunori Ishihara; Kazuo Saito, and Kazunobu Yamamoto, all of Ebina, Japan, assignors to Rank Xerox, Ltd., London, England

Filed Feb. 8, 1977, Ser. No. 766,814
Int. Cl.[2] F27B 9/28; F27D 15/02
U.S. Cl. 432—59 7 Claims

1. Fuser apparatus for fixing toner images to copy substrates, said apparatus comprising:

means for softening toner images on said copy substrates;

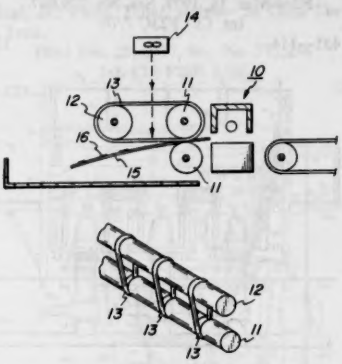
means for conveying said copy substrates to said softening means with said toner images in a predetermined orientation whereby said toner images are exposed to said softening means;

means for transporting said substrates from said toner softening means, said transporting means including nip forming members through which the copy substrates are moved;

one of said nip forming members comprising a roll member having a plurality of circumferential recesses therein, receiving a plurality of belt members which belt members protrude beyond the surface of the roll member whereby they contact the toner image side of the substrates and the surface of the roll member does not;

a second roll member also having recesses therein for receiving said belt members, said first and second roll members being adapted to be rotated along with the other of said nip forming members to thereby transport said copy substrates away from said toner softening means;

said first nip forming member being disposed intermediate said second roll member and said toner softening means

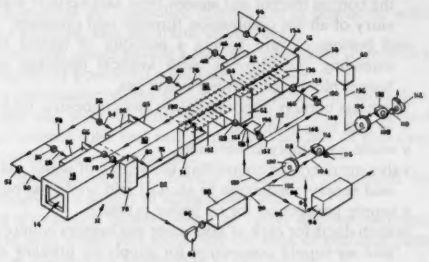


4,092,100

DRYING OVEN

William A. Phillips, Comstock Park, Mich., assignor to Granco Equipment, Inc., Grand Rapids, Mich.

Filed Sep. 17, 1976, Ser. No. 724,351
Int. Cl. F23J 15/00
U.S. Cl. 432—72 8 Claims



8. In a drying oven having:

an elongated chamber through which articles having solvent containing coatings may pass from an entrance end to an exit end;

means for withdrawing solvent-laden gases from the chamber;

means for supplying heated makeup air to the elongated chamber for drying articles as they pass therethrough;

an incinerator having an inlet and an outlet for oxidizing solvents in the solvent-laden gases;

means for passing the solvent-laden gases from the withdrawing means to the incinerator inlet for oxidizing the solvent in the oven exhaust gases;

means for heat exchanging the heated exhaust from the incinerator with air;

the improvement which comprises:

means for supplying air under pressure to said heat exchange means;

means for passing air, thus heat exchanged by the heat exchanger, to the heated air supply means for the elongated chamber; and

the makeup air supply means including a nozzle means positioned uniformly along at least a portion of the elongated chamber to direct high pressure air streams against the work such that the work passing therethrough is uniformly contacted by heated, pressurized air, the nozzle means being formed from elongated pipes which extend across the elongated chamber, each of the elongated pipes having a plurality of jet nozzle openings along the length thereof for directing heated air against the work as it passes through the elongated chamber.

4,092,101

PROCESS FOR FIXING PRINTS WITH REACTIVE DYESTUFFS ON TEXTILE MATERIALS OF NATIVE OR REGENERATED CELLULOSE AND MIXTURES THEREOF WITH SYNTHETIC FIBERS

Gerhard Dillmann, Kriftel, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 560,511, Mar. 20, 1975, abandoned, which is a continuation of Ser. No. 374,117, Jun. 27, 1973, abandoned. This application Jan. 7, 1977, Ser. No. 757,499
Claims priority, application Germany, Jun. 29, 1972, 2231691
Int. Cl.[2] D06P *3/10*
U.S. Cl. 8—1 E 2 Claims

1. A process for fixing prints with reactive dyestuffs on textile materials of native or regenerated cellulose fibers and fiber mixtures which contain such fibers in admixture with synthetic fibers, which process comprises applying on the textile material a neutral printing composition containing a reactive dyestuff, drying the printed material, and thereafter fixing said prints according to the two -stage cold-dwell method by impregnating said material with an alkali mixture of liquid soda water glass of 48°–52° Be in a weight ratio of Na_2O : SiO_2 of 1 : 2.6 and sodium hydroxide solution of 48°–50° Be, the weight ratio Na_2O : SiO_2 of the final fixing solution being 1 : 1.9 to 1 : 2.3.

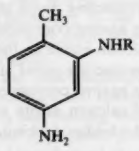
4,092,102

DYEING KERATIN FIBERS WITH 2-SUBSTITUTED M-TOLUENEDIAMINES

Alexander Halasz, Norwalk, and David Cohen, Stamford, both of Conn., assignors to Clairol Incorporated, New York, N.Y.

Division of Ser. No. 406,442, Oct. 15, 1973, abandoned. This application Aug. 20, 1976, Ser. No. 716,052
Int. Cl.[2] A61K *7/12;* D06B *1/32*
U.S. Cl. 8—11 14 Claims

1. Oxidation dye compositions comprising a water containing oxidation hair dye vehicle containing a para component and meta component being reactive with each other in the presence of an oxidizing agent to form a colored dye on hair, said meta component being an N^2-substituted m-toluenediamine of the formula:



or non-toxic salts thereof, wherein R is alkyl or hydroxyalkyl; and said para component being selected from p-phenylenediamine, p-toluenediamine, and p-aminodiphenylamine the ph of said aqueous composition being 8–11.

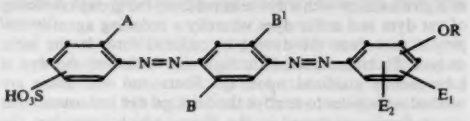
4,092,103

PROCESS FOR DYEING NYLON WITH LOWER ALKYL ETHER-CONTAINING DIAZO DYES AND PRODUCT THEREOF

Hans Alfred Stingl, Toms River, N.J., assignor to Toms River Chemical Corporation, Toms River, N.J.

Continuation of Ser. No. 530,582, Dec. 9, 1974, abandoned, which is a division of Ser. No. 751,386, Aug. 9, 1968, Pat. No. 3,862,119. This application Mar. 26, 1976, Ser. No. 670,799
Int. Cl.[2] C09B *31/02;* D06P *1/06, 3/24*
U.S. Cl. 8—41 B 9 Claims

1. Nylon fiber dyed with a compound of the formula



wherein A is hydrogen, lower alkyl, lower alkoxy or chlorine, B is hydrogen, lower alkyl, or lower alkoxy, B^1 is lower alkoxy, E_1 is hydrogen, lower alkyl, or lower alkoxy, E_2 is hydrogen, lower alkyl or lower alkoxy, R is lower alkyl, —OR is ortho or para to the azo linkage and $—SO_3H$ is meta or para to A.

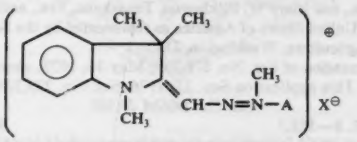
4,092,104

PROCESS FOR MAKING YELLOW, BASIC AZOMETHINE DYES

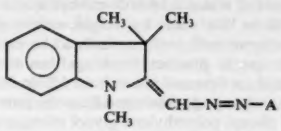
Ray Allen Clarke, Pitman, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 448,363, Mar. 5, 1974, Pat. No. 3,973,903. This application Mar. 22, 1976, Ser. No. 668,913
Int. Cl.[2] C09B *27/00;* C08J *3/20*
U.S. Cl. 8—41 R 1 Claim

1. In a process for making solutions of dyes of the formula



comprising reacting a precursor of the formula



wherein A is phenyl or phenyl substituted by 1 to 3 groups selected from C_{1-4} alkyl and C_{1-4} alkoxy, and X is an anion, with dimethyl sulfate in solution and in the presence of an acid-binding agent, the improvement comprising

(i) reacting dimethyl sulfate in a molar excess of from 100% to 300% per mole of precursor, in an aqueous solution having at least 30 weight percent water and from 2.0 to 3.5 moles of magnesium oxide per mole of precursor, and

(ii) adjusting the constituency of the solution made in step (i) to produce a dye solution comprising 5% to 50% by weight of dye, 10% to 95% by weight of at least one solvent selected from the group consisting of acetic acid, formic acid, propionic acid, glycolic acid, benzyl alcohol, diacetone alcohol, ethylene glycol, diethylene glycol, propylene glycol, ethylene glycol monomethyl ether, and ethylene glycol monoethyl ether, and 0 to 40% by weight of water.

4,092,105

METHOD OF RECOVERING OXIDIZED DYE FROM DYE WASH WATER

John K. Sullins, Kingsport, Tenn., assignor to Canton Textile Mills, Inc., Canton, Ga.

Continuation-in-part of Ser. No. 639,840, Dec. 11, 1975, abandoned. This application Feb. 18, 1977, Ser. No. 770,219
Int. Cl.[2] C09B *7/00;* D06P *5/00;* B01D *15/06*
U.S. Cl. 8—81 9 Claims

1. In a process for the dyeing of fibers in a caustic dye bath

of high alkalinity with a dye selected from the group consisting of vat dyes and sulfur dyes whereby a reducing agent is employed to reduce the dye to its reduced form in the bath, undyed fibers are passed through said bath and the dye is subsequently oxidized upon the fibers and the fibers are washed with water to remove the oxidized dye and caustic that is not firmly entrapped in the fibers, which comprises the recovery of the oxidized dye that is removed by washing the fibers by first adding to the water in which the fibers have been washed a metallic precipitating ingredient selected from the group consisting of elemental aluminum, tin, ferric iron, chromium, lead and compounds thereof that ionize in a caustic solution, said wash water containing a source of hydroxyl ions, and reducing the pH of the wash water to between 6 and 6.8 so that a precipitate of the dye and the reaction product of the metallic ion in the precipitating ingredient and hydroxyl ions in the wash water is formed and separating the precipitate from the water and supplying the precipitate and additional dye selected from the group consisting of vat dyes and sulfur dyes to the caustic dye bath for recycling in the dyeing process.

4,092,106

EMULSION SYSTEMS FOR IMPARTING DURABLE PRESS PROPERTIES TO COTTON AND COTTON-POLYESTER BLENDED TEXTILES

Ralph J. Berni, Metairie; Ruth R. Benerito, New Orleans, both of La., and Mary W. Pilkington, Texarkana, Tex., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation of Ser. No. 578,299, May 16, 1975, abandoned. This application Sep. 22, 1976, Ser. No. 725,225

Int. Cl.[2] D06M *13/08*

U.S. Cl. 8—115.7 **9 Claims**

1. A method for imparting durable press properties to cotton and cotton-polyester blended textiles comprising the steps of:

(a) preparing an emulsion containing a durable press imparting amount of water soluble N-methylol urea resin, about from 10% to 30% water by weight, a chlorinated hydrocarbon solvent sufficiently volatile to be easily removed from the textile product resulting from the method, a Lewis acid catalyst and about from 1% to 3% by weight of an emulsifying agent selected from the group consisting of vinyl phenyl polyethylene glycol ether, sodium sulfate derivative of 3,9-diethyltridecanol-6, sodium sulfate derivative of 7-ethyl-2-methyl-4-undecanol, sodium lauryl sulfate, and hydrocarbon-sodium sulfonate dry cleaning soap;

(b) padding a cotton or cotton-polyester blended textile with the emulsion resulting from step (a) to a 100 to 110% wet pick-up by weight;

(c) drying and curing the padded textile resulting from step (b).

4,092,107

PROCESS FOR FINISHING TEXTILE MATERIALS CONTAINING CELLULOSE FIBERS

Heinz Beck, Duren, and Gerhard Schlichtmann, Wuppertal, both of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed May 3, 1976, Ser. No. 682,263

Claims priority, application Germany, May 7, 1975, 2520224

Int. Cl.[2] D06M *15/40*

U.S. Cl. 8—116 R **11 Claims**

9. In a process for finishing a fabric containing cellulose fibers to improve its crease resistance, soil release and wet soiling properties while retaining a hand similar to that of the fabric prior to finishing which comprises saturating the fabric with an aqueous latex which will improve the crease-resistance of the fabric, the improvement which comprises including in the latex the polymerization product of a mixture of from about 70% to about 97% by weight of an ester of acrylic acid and a saturated monohydric alcohol having 1 to 8 carbon atoms and from about 30% to about 3% of an ester of acrylic acid and an unsaturated monohydric alcohol having 2 to 5 carbon atoms.

4,092,108

COMPOSITIONS AND PROCESS FOR IMPARTING DURABLE FLAME RESISTANCE TO CELLULOSIC TEXTILES

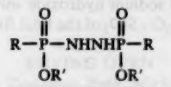
Emery I. Valko, deceased, late of Belmont, Mass. (by Hermina Valko, executrix); Giuliana C. Tesoro, Dobbs Ferry, N.Y., and Walter F. Olds, Arlington, Mass., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 654,181, Feb. 3, 1976, abandoned. This application Jan. 10, 1977, Ser. No. 758,312

Int. Cl.[2] D06M *13/26*

U.S. Cl. 8—116 P **7 Claims**

1. The compound having the following formula



where R is an alkyl or a halogen-substituted alkyl having from 1 to 4 carbon atoms, and R′ is an alkyl or halogen-substituted alkyl having from 1 to 4 carbon atoms.

4,092,109

METHOD FOR CORROSION INHIBITION OF REINFORCED BRIDGE STRUCTURES

Arnold Morry Rosenberg, Potomac, and James Michael Gaidis, Ellicott City, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Jun. 28, 1976, Ser. No. 700,343

Int. Cl.[2] C23F *11/04, 11/08, 9/02;* **C09K** *3/18*

U.S. Cl. 21—2.5 R **2 Claims**

1. The method of protecting metal structures in hydraulic cement bridge decking against corrosion comprising applying an agent consisting calcium nitrite to the bridge decking.

2. The method of protecting metal structures in hydraulic cement bridge decking against corrosion comprising applying an agent consisting of calcium nitrite to the juncture of the metal structure with the bridge decking.

4,092,110

METHOD OF PROTECTING WOOD WITH PERFLUOROALKANE SULFONATES

Heinrich Adolphi; Matthias Schwarzmann, both of Limburgerhof, and Peter Heinze, Ellerstadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Claims priority, application Germany, Mar. 6, 1976, 2609311

Filed Feb. 18, 1977, Ser. No. 770,094

Int. Cl.[2] A01N *9/12, 9/24;* **B27K** *3/36*

U.S. Cl. 21—7 **6 Claims**

1. A method of inhibiting attack by animal pests in wood or wood-base materials, wherein the wood or wood-base material is contacted with a compound of the formula

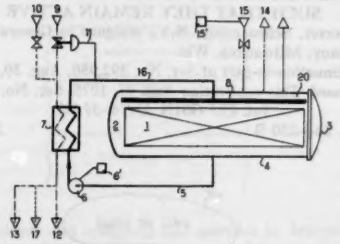
$$C_nF_{2n+1}—SO_3M,$$

where *n* denotes one of the integers from 1 to 14 and M denotes hydrogen or a cation.

4,092,111
APPARATUS FOR THE HEAT TREATMENT OF PRODUCTS CONTAINED IN SEALED CONTAINERS

Daniel Clement Gaignoux, Saint Maurice, and Jean-Pierre Pinot, Boulogne sur Seine, both of France, assignors to F. Hanau S. A. and Barriquand, both of Paris, France

Continuation of Ser. No. 624,567, Oct. 21, 1975, abandoned. This application Mar. 17, 1977, Ser. No. 778,456
Claims priority, application France, Oct. 24, 1974, 74 35637
Int. Cl.[2] A23L *1/00, 3/10;* A61L *3/00, 3/02*
U.S. Cl. 21—93 11 Claims



1. Apparatus for the heat treatment of sealed packages, comprising

a heat treatment enclosure filled with a gaseous atmosphere, for containing the sealed packages, said enclosure containing means to support the sealed packages;

means to supply and distribute in a divided form a small volume of a heat exchange liquid within said enclosure and over the sealed packages by streaming said liquid over the sealed packages, said distributing means comprising a plurality of substantially horizontal divider plates superposed with respect to one another in said enclosure, said divider plates having perforations formed in their lower surfaces through which the heat exchange liquid streams downwardly in a fractionated manner over the sealed packages, at least one of said divider plates comprising a hollow member having perforations in the upper and lower surfaces thereof, at least one hollow sleeve connected with said hollow member to which it conducts the streaming liquid, said sleeve being slidably engageable with sleeves corresponding to the remainder of said divider plates to form with them piping for the distribution of the streaming liquid;

means for feeding the heat exchange liquid to the upper portion of said enclosure and thence to the uppermost of said divider plates, said feeding means comprising means to ensure that said uppermost divider plate supports a constant charge of liquid equal at all points;

means for recirculating the heat exchange liquid from the bottom to the top of said enclosure and at a rate sufficient to prevent the sealed packages from becoming immersed in the heat exchange liquid; and

means for modifying the temperature of the heat exchange liquid before its introduction into said feeding means.

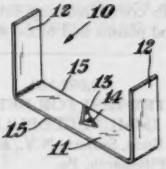
4,092,112
SOIL FUMIGANT KIT

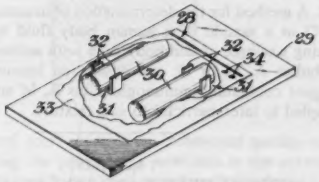
James Stewart Calkins, and Alfred Nilsen, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 605,126, Aug. 15, 1975, abandoned. This application Nov. 10, 1976, Ser. No. 740,985
Int. Cl.[2] A61L *9/04, 3/00;* A01M *13/00;* B26F *1/32*
U.S. Cl. 21—108 5 Claims

1. In a kit for fumigating a plot of soil, under a piece of substantially fumigant-impermeable polymeric film adapted to cover said plot, which kit includes at least one metal can filled with volatile soil fumigant and at least one means for puncturing each said can through the sidewall from the underside thereof,

the improvement which comprises utilizing as said at least one metal can, a thin-walled metal can, and utilizing as said means for puncturing each such can a bent strip of sheet metal having a substantially flat base portion and an arm portion projecting approximately perpendicularly thereto at each end of the base portion, the pair of arm portions being substantially parallel whereby the strip has



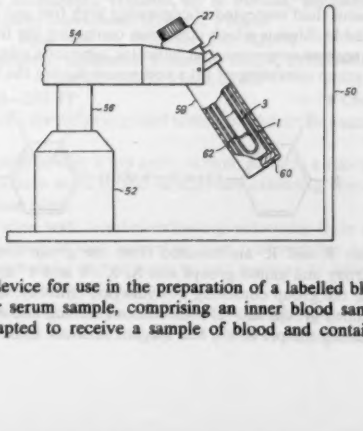


a general U-shape as viewed in profile, and about midway the ends of the base portion a sharp pointed prong portion formed from the base portion and projecting therefrom in the same general direction as the arm portions and substantially perpendicularly to the base portion, and said arm portions of each means for puncturing being adapted as a pair to embrace and frictionally engage the sidewalls of one of said metal cans between the ends thereof when pressed thereabout the sidewalls thereof prior to puncturing said can.

4,092,113
PREPARATION OF BLOOD PLASMA AND SERUM SAMPLES

Stanley Matthias Hardy, Huntingdon, England, assignor to Aesculapius Scientific Limited, England

Filed Sep. 16, 1976, Ser. No. 724,064
Claims priority, application United Kingdom, Sep. 24, 1975, 39075/75; Aug. 23, 1976, 34957/76
Int. Cl.[2] G01N *33/16*
U.S. Cl. 23—230 B 31 Claims



26. A device for use in the preparation of a labelled blood plasma or serum sample, comprising an inner blood sample vessel adapted to receive a sample of blood and contained

within an outer plasma or serum sample vessel which is provided with an area adapted to enable labelling and which is adapted to receive a sample of blood plasma or serum derived from blood contained within the inner blood sample vessel; and means for releasably connecting together the two vessels; the two sample vessels each comprising a generally cylindrical sample tube having an opening at one end thereof, the inner sample tube being positioned in parallelism within the outer sample tube with the opening of the inner tube adjacent the opening of the outer tube, and wherein the inner sample vessel has a leakage path communicating between the two vessels permeable to blood plasma and blood serum but not to blood and comparing the color obtained with colors obtained using standard chlorine containing aqueous fluids.

4,092,114

INDIRECT LATEX TEST FOR DETERMINATION OF IMMUNOGLOBULINS

Francis Fremonte Buck, Suffern, N.Y., assignor to Fisher Scientific Company, Pittsburgh, Pa.

Filed Oct. 20, 1976, Ser. No. 734,216
Int. Cl.² G01N *33/16*
U.S. Cl. 23—230 B **3 Claims**

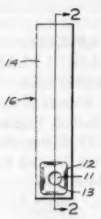
1. A method for the determination of immunoglobulins A, M or G in a sample of a human body fluid which comprises mixing a sample of said body fluid with antiserum to immunoglobulins A, M or G; and adding an immunoglobulin latex reagent containing immunoglobulins A, M and G chemically coupled to latex particles to said mixture.

4,092,115

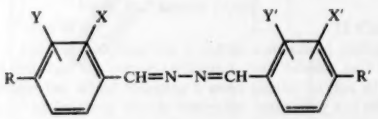
METHOD, DEVICE AND TEST REAGENT FOR DETECTING FREE AVAILABLE CHLORINE IN AQUEOUS FLUIDS

Chauncey Orvis Rupe, Jerusalem, Israel, and Robert Bauer, Bristol, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Continuation of Ser. No. 460,022, April 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 12,571, Feb. 19, 1970, abandoned. This application May 20, 1977, Ser. No. 798,750
Int. Cl.² G01N *31/22, 33/18*
U.S. Cl. 23—230 R **6 Claims**



1. A method for detecting only free available chlorine in an aqueous fluid suspected of containing both free and combined available chlorine which comprises contacting the fluid with a test reagent comprising an indicator substance selected from the group consisting of (1) a compound having the formula



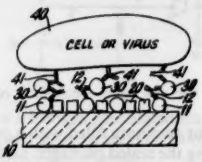
where R and R′ are selected from the group consisting of hydroxy and amino groups and X, X′, Y and Y′ are selected from the group consisting of hydrogen, hydroxy, methyl and methoxy groups and (2) combinations thereof, and a buffer for adjusting the pH of the test reagent to about from 3.5 to 8.5;

4,092,116

METHOD FOR BINDING ANTIBODIES TO A SURFACE SUCH THAT THEY REMAIN ACTIVE

Ivar Giaever, Schenectady, N.Y., assignor to General Electric Company, Milwaukee, Wis.

Continuation-in-part of Ser. No. 392,950, Aug. 30, 1973, abandoned. This application Aug. 27, 1975, Ser. No. 608,349
Int. Cl.² G01N *33/16, 31/02*
U.S. Cl. 23—230 B **58 Claims**



1. A method for binding reactive constituents to a surface so that they remain active comprising the steps of coating a metallized slide with a monomolecular layer of a reactive first constituent and inert organic compound so that the first constituent molecules are separated from each other by inert organic molecules, and subsequently exposing the coated slide to an aqueous medium containing a reactive second constituent specific to the first constituent to cause a reaction therewith in which the second constituent molecules bond with the first constituent molecules to form a bimolecular layer on the slide, the inert organic compound being of sufficient quantity to obtain sufficient average spacing between adjacent first constituent molecules in the monomolecular layer so that the second constituent molecules retain active sites for a further immunological reaction.

4,092,117

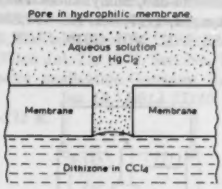
DEVICE AND METHOD FOR MONITORING THE METAL CONTENT OF AQUEOUS SYSTEMS

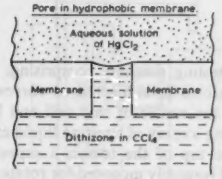
Geoffrey Arthur Byrne, Gifford, Scotland, assignor to Inveresk Research International, Musselburgh, England

Filed Aug. 6, 1976, Ser. No. 712,251
Claims priority, application United Kingdom, Aug. 13, 1975, 33693/75
Int. Cl.² G01N *31/22, 33/18*
U.S. Cl. 23—230 R **7 Claims**

1. A method of monitoring the metal content in a water system comprising the steps of allowing continuous samples of said water system to contact one side of a porous membrane capable of allowing said metal ions to diffuse therethrough, maintaining in contact with the other side of said porous membrane an organic liquid medium containing a trapping agent therein, capable of forming with said metal ions complexes

which are soluble in said organic liquid medium; and removing at intervals samples of said organic liquid medium containing





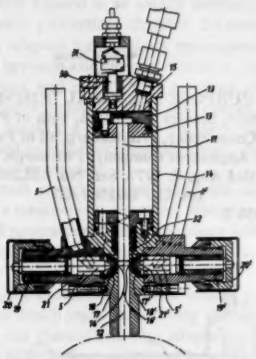
said complexes and analysing said samples to determine the accumulation of said metal ion over a predetermined period.

4,092,118

MIXING HEAD

Dietrich Mühle, Kressbronn, Germany, assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Nov. 19, 1976, Ser. No. 743,531
Claims priority, application Germany, Dec. 8, 1975, 2555177
Int. Cl.[2] B01F *15/02*; B01J *1/00, 4/00*
U.S. Cl. 23—252 R **4 Claims**



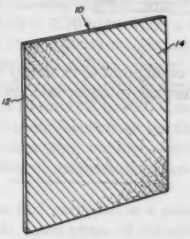
1. A mixing head for mixing at least two different plastic material components, comprising a casing having an axially elongated cylindrical mixing chamber, separate inlet ports entering said chamber intermediate its axial extent for introducing into said chamber the respective plastic components to be mixed therein, said chamber having a common outlet at one end for expulsion therefrom of the component mixture formed therein, an expulsion piston having a free end facing said outlet, said piston being received in said mixing chamber and reciprocable therein between a retracted position wherein its free end is retracted beyond said inlet ports, thereby uncovering them to allow entry of components into the mixing chamber, and an extended position wherein said free end of said piston is substantially coincident with said outlet of said mixing chamber, thereby causing said piston to expel component mixture therefrom and cover said inlet ports to prevent entry of further components into said mixing chamber, means for reciprocating said expulsion piston, means for determining the duration of the period during which said inlet ports are uncovered by reciprocation of said piston, and means actuated by said piston for initiating operation of said last-named means.

4,092,119

ENVIRONMENTAL QUALITY INDICATOR

Robert E. Baier, Buffalo, and Vito A. DePalma, Tonawanda, both of N.Y., assignors to Calspan Corporation, Buffalo, N.Y.

Continuation-in-part of Ser. No. 418,500, Nov. 23, 1973, abandoned. This application Jul. 11, 1975, Ser. No. 595,265
Int. Cl.[2] G01N *31/00*
U.S. Cl. 23—253 TP **20 Claims**



1. A waterproof, scuff-resistant environmental quality indicator for indicating the presence of pesticides in the environment and which normally is abrasion and scuff developable to give the same initial color and/or resistance change as the said pesticides being monitored or tested, comprising:

an environmentally inert, weather-resistant substrate having a topographically varying surface including substantially uniformly located raised portions defining a scuff and abrasion level, the remainder of said topographically varying surface defining a relieved portion beneath said scuff and abrasion level; and

an abrasion and scuff-developable indicator formulation which gives the same initial color and/or resistance changes as the said pesticides, said formulation for detecting pesticides applied to at least said relieved portion of said substrate whereby said indicator formulation applied to said relieved portion of said substrate is protected by said raised portions from being abrasion-developed while remaining freely exposed to the environment for the indicating of the presence of pesticides.

4,092,120

METHOD AND APPARATUS FOR ESTABLISHING FECAL OCCULT BLOOD

Osmo Suovaniemi, Helsinki; Pertti Virkola, Kauniainen, and Herman Adlercreutz, Helsinki, all of Finland, assignors to Osmo Antero Suovaniemi, Helsinki, Finland

Filed Nov. 19, 1976, Ser. No. 743,470
Claims priority, application Denmark, Dec. 8, 1975, 3440/75
Int. Cl.[2] G01N *33/16, 21/06*
U.S. Cl. 23—253 TP **9 Claims**

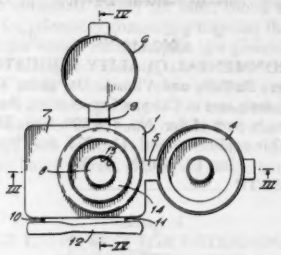
1. A device for the storage and testing of a laboratory sample including:

a base plate having a top and a bottom surface, a recess in said bottom surface, and an aperture extending through said base plate;

a first raised wall member extending outwardly from said top surface of said base plate, said wall member being disposed about and adjacent to said aperture to define a storage area for said sample;

a first cover including a raised portion which extends into the storage area defined by said raised wall member to

compress said sample when said first cover is placed over said top surface of said base plate; and



a second cover configured to fit snugly within said recess in said bottom surface to cover said aperture.

4,092,121

TITRATION APPARATUS

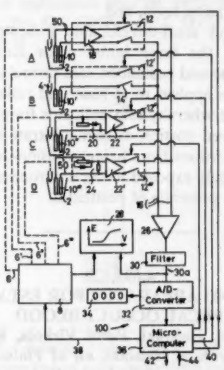
Heinz Rutishauser, Greifensee, and Otakar Siroky, Bottmingen, both of Switzerland, assignors to Mettler Instrumente AG, Zurich, Switzerland

Filed Apr. 20, 1977, Ser. No. 789,263

Claims priority, application Switzerland, Jun. 9, 1976, 7231/76

Int. Cl.² G01N *31/16*

U.S. Cl. 23—253 R **7 Claims**



1. A titration apparatus comprising:

means for dispensing titrant to at least one sample to be analysed;

a pair of electrodes for delivering signals relevant to the sample undergoing analysis;

evaluation means for receiving and evaluating the signals delivered by said electrodes;

an exchangeable module for operatively connecting said electrodes with said evaluation means;

said exchangeable module containing component means for accommodating the titration apparatus to a selected mode of operation; and

said exchangeable module comprises a plug-in printed circuit.

4,092,122

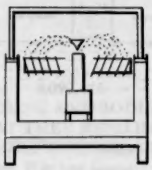
CORROSION TESTING MACHINE

Nagaichi Suga, 32 Banshu-cho, Shinyuka-ku Tokyo, Japan

Filed Apr. 28, 1977, Ser. No. 791,886

Int. Cl.² B08B *3/02, 3/08;* G01N *17/00, 33/20*

U.S. Cl. 23—253 C **6 Claims**



1. A corrosion testing machine comprising: a cell within which specimens are to be subjected to corrosion testing; a spraying tower in the center of said cell and having means therein for producing a spray of a testing liquid extending in all directions from the top of the tower; a supporting column within said cell and rotatably mounted for rotation around said spraying tower; means coupled to said supporting column for rotating said column around said spraying tower; and an annular frame means mounted on said supporting column around said spray tower having means for supporting test pieces thereon in an inwardly and downwardly inclined position with the surfaces to be tested facing inwardly and upwardly toward the top of said spray tower, whereby the spray of the testing liquid is evenly applied to the surface of the specimens to be tested.

4,092,123

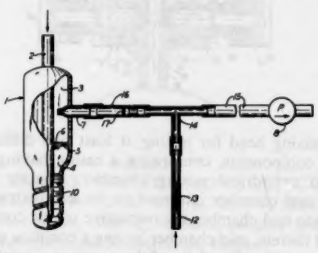
DUAL PURPOSE PERSONAL DOSIMETER

Frank J. Vancheri; Stanley P. Nebash, both of Pittsburgh, and Paul W. McConnaughey, Wilkinsburg, all of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Aug. 8, 1977, Ser. No. 822,396

Int. Cl.² G01N *1/00*

U.S. Cl. 23—254 R **5 Claims**



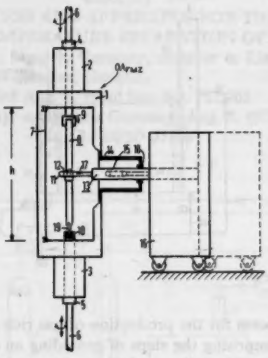
1. A dual purpose personal dosimeter comprising a bubbler provided with an inlet for contaminated air and with an air outlet, a transparent detector tube provided with an inlet for contaminated air and with an air outlet, a chemical in said tube that changes color when certain contaminants in air flow through it, a suction pump provided with an inlet, conduit means connecting said air outlets with the pump inlet to draw contaminated air into said bubbler and tube simultaneously, and means for restricting flow of air from the bubbler to the pump relative to the flow from the tube to the pump.

4,092,124

APPARATUS FOR FLOATING MELT ZONE PROCESSING OF A SEMICONDUCTOR ROD

Hans Stut, Groebenzell, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jul. 23, 1976, Ser. No. 707,957
Claims priority, application Germany, Jul. 29, 1975, 2533858
Int. Cl.[2] B01J *17/10*
U.S. Cl. 23—273 R 1 Claim



1. In an operational apparatus for the floating melt zone processing of a vertically oriented semiconductor rod of the type including a housing defining a processing chamber therein, a pair of rod-support members positioned at opposite ends of said processing chamber for vertically supporting such semiconductor rod therebetween, means for vertically moving said rod-support members relative to said chamber, an induction heating coil located in an axially substantially fixed position within said processing chamber between said support members and adapted for annularly encompassing a zone of a rod mounted between said support members, a high-frequency generator means, and cable means coupling said heating coil and said generator means for supplying energy to said heating coil so as to generate a melt zone on such rod when such is being processed in said processing chamber, the improvement comprising in combination:

A. tube means associated sealingly with said housing and defining a transversely extending side chamber projecting from said processing chamber between said support members, said tube means having a lateral aperture defined therein;

B. horizontally extending shift rod means, including fastening means functionally supporting said heating coil at a forward end thereof and also adapted to energize same, and further including seal means located slidably circumferentially thereabout and mounted about said aperture, so that a terminal opposed end of said shaft rod means is outside said side chamber;

C. auxiliary supporting means located adjacent said housing and adapted to hold said generator means;

D. supporting surface engaging roller means, including mounting means for joining said auxiliary supporting means and said roller means for transverse, reciprocal movements of said auxiliary supporting means towards and away from the lateral outside end of said tube means;

E. said terminal opposed end being functionally connected with said generator means and adapted to be energized by same for operating said heating coil; and

F. said heating coil, said shift rod means, and said auxiliary supporting means, and said generating means thereby being in a spatially substantially fixed interrelationship to one another and movable laterally and reciprocably as a unit relative to said housing.

4,092,125

TREATING SOLID FUEL

Edgel P. Stambaugh, and Satya P. Chauhan, both of Worthington, Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Continuation of Ser. No. 563,837, Mar. 31, 1975, abandoned.
This application Dec. 27, 1976, Ser. No. 754,153
Int. Cl.[2] C10L *9/10;* C10B *57/00*
U.S. Cl. 44—1 R 39 Claims

1. A method of treating fine particles of solid carbonaceous fuel of the coal of coke type comprising

(i) mixing the fuel particles with a liquid aqueous solution comprising essentially (a) sodium or potassium hydroxide together with (b) calcium or magnesium hydroxide or carbonate, or a plurality thereof, with a ratio of (a) to the fuel of about 0.10 to 0.70 by weight, a ratio of (b) to the fuel of about 0.10 to 0.30 by weight, and a ratio of water to the fuel of about 1 to 10 by weight;

(ii) heating the resulting mixture, at an elevated pressure, and a temperature of about 175° to 300° C in such a manner as to leach soluble components from the fuel particles and to incorporate within the volume thereof a significant amount of calcium or magnesium to provide a gasification catalyst;

(iii) separating the fuel particles, as a solid phase, from the easily removable liquid phase of the solution; and

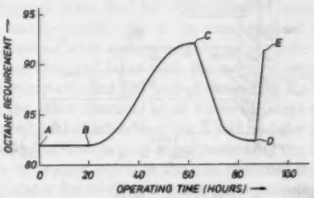
(iv) washing the separated fuel particles; in such manner as to produce a clean, reactive, solid fuel containing a gasification catalyst and adapted for use as a gasification feedstock.

4,092,126

FUEL AND LUBRICANT COMPOSITIONS FOR INHIBITION OF PREVENTION OF OCTANE REQUIREMENT INCREASE

Anthony R. Gatti; James S. Hokanson, and Kenzie Nozaki, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 19, 1975, Ser. No. 614,822
Int. Cl.[2] C10L *1/32*
U.S. Cl. 44—51 14 Claims



1. An improved hydrocarbon fuel composition for use in spark-ignition, internal combustion engines, comprising gasoline containing an octane requirement increase-inhibiting amount in the range from about 0.1 to about 500 mg/gallon of a high surface area, refractory solid acid catalyst having:

a. an average particle size in the range of about 0.01 to about 10 microns, and

b. surface acid centers formed by metallic, hydrocarbon insoluble cations of sufficiently high acidity such that the average non-volatile surface acidity is 1 or less, expressed in pKa units.

4,092,127

ANTI-DIESELING ADDITIVE FOR SPARK IGNITION ENGINES

Jack Ryer, East Brunswick, and Martin F. Dooley, Edison, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Dec. 20, 1976, Ser. No. 752,467
Int. Cl.[2] C10L *1/14, 1/22*
U.S. Cl. 44—63 5 Claims

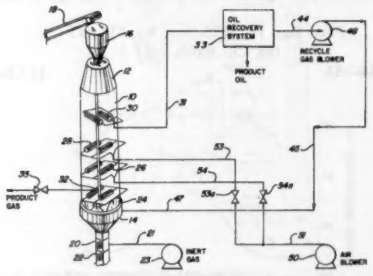
1. A method for treating an automotive vehicle having a gasoline spark ignition internal combustion engine which is dieseling, by adding to the fuel tank of said vehicle, about 0.2 to 1.0 fluid ounce, per gallon of gasoline, of a gasoline additive concentrate consisting essentially of 1 part by weight of a boron containing acyl nitrogen compound and from about 2 to 40 parts by weight of a solvent oil having a kinematic viscosity at 99° C. of from 8 to 20 centistokes, said concentrate containing from about 0.007 to 0.3 wt. % boron and from about 0.03 to 1.4 wt. % nitrogen, wherein said boron containing acyl nitrogen compound is characterized by the presence within its structure of a substantially saturated hydrocarbon-substituted polar group selected from the class consisting of acyl, acylimidoyl, and acyloxy radicals wherein the substantially saturated hydrocarbon substituent contains from about 16 aliphatic to 180 aliphatic carbon atoms, and a nitrogen-containing group characterized by a nitrogen atom attached directly to said polar radical, and wherein said boron containing acyl nitrogen compound contains from 0.3 to 0.9 wt. % boron.

4,092,128

DESULFURIZED GAS PRODUCTION FROM VERTICAL KILN PYROLYSIS

Harry A. Harris, Rifle, and John B. Jones, Jr., Grand Junction, both of Colo., assignors to Paraho Corporation, Grand Junction, Colo.

Filed May 24, 1976, Ser. No. 689,079
Int. Cl.[2] C10K *1/20*
U.S. Cl. 48—197 R 11 Claims



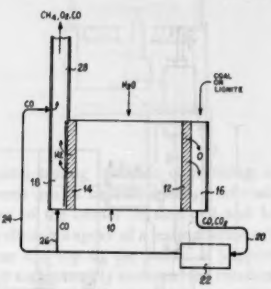
1. A process for eliminating sulfur contaminants from the combustible gas produced from a pyrolysis of an oil shale containing calcium or magnesium carbonate calcinable to a sufficient quantity of calcium or magnesium oxides to react with all sulfur compositions present in the gas, with the pyrolysis being conducted at least above about 900° F, which comprises passing a produced gas from an oil shale pyrolysis through a column of hot retorted oil shale which contains at least partially decomposed calcium or magnesium carbonate, said retorted shale being sufficiently hot so that the produced gas may be withdrawn at a temperature in excess of at least 700° F and be essentially free of sulfur contaminants.

4,092,129

PROCESS FOR PRODUCING METHANE RICH GAS

Philippe Goudal, Bures sur Yvette, France, assignor to Electricite de France (Service National), Paris, France

Filed Aug. 23, 1976, Ser. No. 716,627
Claims priority, application France, Aug. 26, 1975, 75 26262
Int. Cl.[2] C10J *3/18;* C10K *3/04*
U.S. Cl. 48—210 6 Claims



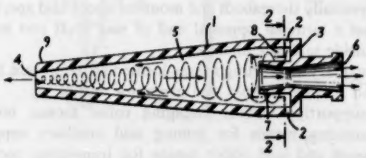
1. A process for the production of gas rich in methane, the process comprising the steps of providing an electrolytic cell having an anode and a cathode and containing an aqueous electrolytic solution, electrolyzing said aqueous electrolytic solution to produce oxygen at said anode and hydrogen at said cathode, reacting a carbonaceous fuel selected from the group consisting of coal and lignite at said anode with said oxygen to give carbon monoxide, and reacting said carbon monoxide with said hydrogen according to the reaction $CO + 3H_2 \rightarrow CH_4 + H_2O$.

4,092,130

PROCESS FOR THE SEPARATION OF GAS MIXTURES INTO COMPONENT FRACTIONS ACCORDING TO THEIR MOLECULAR OR ATOMIC WEIGHT

Nils A. L. Wikdahl, Bravallavagen 42, Djursholm, Sweden

Continuation-in-part of Ser. No. 655,046, Feb. 4, 1976, abandoned, and Ser. No. 353,148, Apr. 20, 1973, abandoned, and Ser. No. 72,951, Sep. 17, 1970, Pat. No. 3,747,306, said Ser. No. 655,046, is a continuation-in-part of Ser. No. 521,109, Nov. 5, 1974, abandoned, which is a continuation-in-part of Ser. No. 353,288, Apr. 23, 1973, abandoned, which is a continuation-in-part of Ser. No. 53,712, Jul. 10, 1970, abandoned, said Ser. No. 353,148, is a continuation-in-part of Ser. No. 53,712,. This application Mar. 31, 1976, Ser. No. 672,378
Int. Cl.[2] B01D *45/12*
U.S. Cl. 55—15 29 Claims



16. A process for separation of a gas isotope mixture in admixture with an inert gas of lower molecular or atomic weight than the said mixture into at least two gaseous component fractions according to their molecular or atomic weight, comprising applying centrifugal force in a cyclone by rotating the mixture in a conical vortex having peripheral and core vortices and a diameter of not over 5 mm. and a cone angle within the range from 1° to 90°, at a gas inlet absolute pressure of at least 5 mm. Hg., and a pressure ratio

$P_{inlet\ mm.\ Hg.}/P_{core\ outlet\ mm.\ Hg.}$

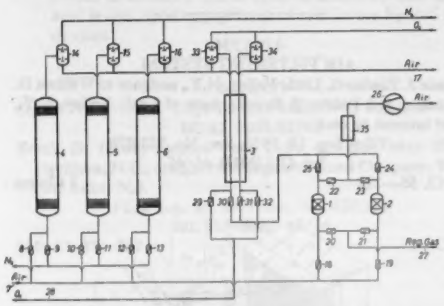
of up to 10; recovering a higher molecular or atomic weight gaseous isotope fraction from the peripheral vortex, and recovering a lower molecular or atomic weight gaseous isotope fraction from the core vortex.

4,092,131

PROCESS AND APPARATUS FOR THE LOW-TEMPERATURE SEPARATION OF AIR

Wilhelm Rohde, Munich, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Aug. 6, 1976, Ser. No. 712,265
Claims priority, application Germany, Aug. 8, 1975, 2535488
Int. Cl.² B01D *53/04*
U.S. Cl. 55—33 **6 Claims**



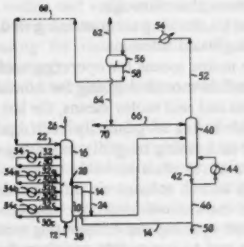
1. In a process for the low-temperature separation of air into dry product gases wherein the entering air is divided into two portions, one portion being freed of impurities in an adsorption process and being then cooled by indirect heat exchange in a secondary heat exchanger against oxygen product gas and the other portion being cooled in a primary heat exchanger directly without an intermediate adsorption treatment, the improvement which comprises freeing said one portion of the air of substantially only H_2O in the adsorption process by passing the air over a dry gel desiccant and periodically interchanging the flow paths for the air and for the oxygen product gas, respectively, in the heat-exchanger.

4,092,132

RECOVERY OF METHACROLEIN

James Leacock, New York, N.Y., assignor to Halcon Research and Development Corp., New York, N.Y.

Filed Sep. 6, 1977, Ser. No. 830,737
Int. Cl.² B01D *19/00*
U.S. Cl. 55—48 **3 Claims**



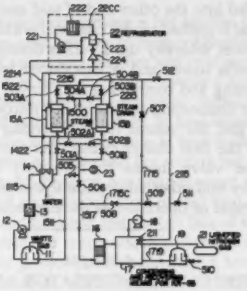
1. A process for the recovery of methacrolein from a gaseous mixture which comprises bringing said mixture into contact with a body of acetic acid.

4,092,133

PROCESS AND APPARATUS FOR TREATING A WASTE GAS INCLUDING COMBUSTIBLE GASES AND RADIOACTIVE KR-85

Kunio Kamiya, Hitachi; Hideo Yusa, Katsuta, and Hiroyuki Tsuchiya, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 22, 1976, Ser. No. 651,534
Claims priority, application Japan, Jan. 27, 1975, 50-10477
Int. Cl.² B01D *15/06*
U.S. Cl. 55—62 **7 Claims**



1. A process for treating a waste gas including oxygen, hydrocarbons and radioactive Kr-85 prior to condensing and recovering Kr-85 from said waste gas which comprises the steps of:

removing the hydrocarbons in the waste gas to produce a treated waste gas free of hydrocarbons,

passing the treated waste gas to one of two charcoal layers cooled to a temperature to promote selective adsorption of Kr-85.

adsorbing the Kr-85 and a portion of the oxygen in the treated waste gas in said one charcoal layer,

discharging a gas containing the remaining portion of oxygen in said treated waste gas from said one charcoal layer to the atmosphere until the one charcoal layer is saturated with Kr-85,

introducing a cooled mono-element gas into said one charcoal layer to purge the portion of oxygen adsorbed therein and

desorbing Kr-85 from the one charcoal layer by heating the one charcoal layer and by continuing to introduce the cooled mono-element gas to the one charcoal layer; the other charcoal layer undergoing the same cyclic operation as the one charcoal layer with the steps of introducing a cooled mono-element gas and of desorbing Kr-85 occurring in the other charcoal layer while the steps of passing the treated gas, of adsorbing the Kr-85 and the portion of oxygen and of discharging a gas containing the remaining portion of oxygen occur in the one charcoal layer.

4. An apparatus for treating a waste gas containing oxygen, hydrocarbons, and Kr-85 which comprises:

two charcoal packed adsorption towers for adsorbing the Kr-85 contained in said waste gas,

means for heating and cooling charcoal within said adsorption towers during desorption and adsorption of said Kr-85,

a first gas treatment means for removing the hydrocarbons in said waste gas,

means for introducing the treated waste gas freed of hydrocarbons from said gas treating means into one end of one of said adsorption towers,

means connected at the other end of said adsorption tower

for discharging a gas freed of Kr-85 exiting from said one adsorption tower to the atmosphere,

means connected to the one end of said one adsorption tower for feeding an inert gas composed of a mono-element to said one adsorption tower, when the discharge means are disconnected,

a first closed circuit for connecting said gas treatment means with said one end of said adsorption tower when the inert gas is fed into the other end of said one adsorption tower and said one adsorption tower is being cooled to return oxygen to said treatment means,

a second closed circuit for connecting one end of said one adsorption tower to a means for condensing and recovering Kr-85,

valve means for interconnecting said second closed circuit to said one end of said one adsorption tower when inert gas is fed into the other end of said one adsorption tower and heat is applied to said charcoal within said one adsorption tower whereby the Kr-85 is desorbed from said one adsorption tower and is introduced into said means for condensing and recovering said Kr-85, and

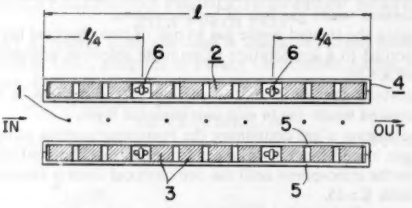
means for connecting the means for introducing the treated waste gas, the means for discharging the gas freed of Kr-85, the first closed circuit, the second closed circuit and the valve means to the other adsorption tower whereby said other adsorption tower will go through the same cycle of operation as the first adsorption tower.

4,092,134

ELECTRIC DUST PRECIPITATOR AND SCRAPER

Yosio Kikuchi, Toyama, Japan, assignor to Nipponkai Heavy Industries Co., Ltd., Toyama, Japan

Filed Jun. 3, 1976, Ser. No. 692,391
Int. Cl.[2] B03C 3/16
U.S. Cl. 55—109 **16 Claims**



1. An electric dust precipitator comprising a pair of groups of elongated tubular dust-collecting electrodes disposed in a chamber, said pair of groups being disposed in opposing, substantially parallel, spaced-apart relationship to each other and defining a gas-flow path therebetween with the transverse distance between said pair of groups being more than 400 mm, means for circulating a cooling fluid through the interiors of said electrodes for controlling the temperature thereof to reduce back ionization, a plurality of elongated discharge wires extending in parallel with said dust-collecting electrodes and being disposed in said gas-flow path between said pair of groups, means for applying a high direct current voltage between said wires connected as the negative electrodes and said dust-collecting electrodes connected as the positive electrodes whereby to negatively charge dust particles in the gas that flows through said gas-flow path so that the charged dust particles are attracted to said dust-collecting electrodes, and two elongated scraping means respectively surrounding the dust-collecting electrodes of the respective groups, each of said scraping means consisting essentially of two sliding bars adapted to slide lengthwise along both side surfaces of said electrodes of its associated group, said scraping means being suspended by chains at points located a predetermined distance inwardly from the longitudinal ends of said bars.

4,092,135

ASSEMBLY OF TUBES FOR ISOTOPIC SEPARATION DIFFUSERS

Pierre Dussaussoy, Bollene; Pierre Mongin, Piolenc; René Rouviere, Orange, and Gilbert Simon, Sevres, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jul. 12, 1973, Ser. No. 377,506
Claims priority, application France, Aug. 10, 1972, 72.28961
Int. Cl.[2] B01D 13/00
U.S. Cl. 55—158 **9 Claims**

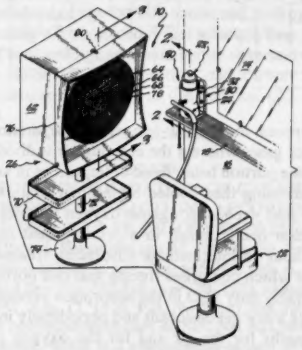
1. An assembly of tubes for isotopic separation diffusers comprising candles made up of filter tubes and secured at each end to a bottom plate and a top plate, the filter tubes of each candle being assembled by fitting together and brazing the skirts at the end of their spigots, the candles being assembled in one bundle by resilient tightening means at at least the level of the spigots, which are slightly larger in diameter than the filter tube bodies, so that the candles in a single bundle make contact via the skirts of the spigots.

4,092,136

AIR FILTERING SYSTEM

Dominic J. Zimbardi, Little Valley, N.Y., assignor to William D. Farnham and Teddar S. Brooks, both of Little Valley, N.Y., part interest to each

Filed Sep. 14, 1976, Ser. No. 723,078
Int. Cl.[2] B01D 46/46
U.S. Cl. 55—212 **2 Claims**



2. An air filtering system for removing particulate material from the air, which comprises in combination:

support means for removably and separately supporting a pair of spray devices adapted under operator control to dispense said particulate material into said air, one of said spray devices being an aerosol can type dispenser and another of said spray devices being a spray gun, said support means including a casing defining an upwardly opening recess sized to receive said dispenser;

a filter for filtering said particulate material from said air when drawn therethrough;

a fan means for drawing air containing said particulate material through said filter;

an electric motor means for operating said fan means;

a floor standard mounted casing for housing said filter, said fan means and said motor means, the last said casing being open ended and of generally rectangular cross-section, said last said casing hingedly mounting adjacent one end thereof a cover plate movable between open and closed positions and an exhaust air diffusion device adjacent an opposite end thereof, said cover plate being formed with an air inlet opening and cooperating with a rim portion of said one end to removably peripherally clamp said filter therebetween; and

electrical circuit means for controlling operation of said

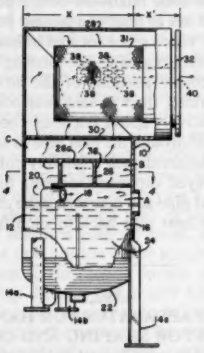
motor means, said electrical circuit means including sensing means responsive to operator removal and return of said spray devices to said support means for energizing and deenergizing said motor means, respectively, said sensing means being operable to energize said motor means when either of said spray devices is removed from said support means by said operator and said sensing means includes a pair of electrical switches supported within said casing of said support means and a pair of levers operatively associated one with each of said switches and supported for pivotal movement by said casing of said support means, a first of said levers having a portion thereof extending into said recess for engagement by said dispenser when received therewithin and a second of said levers having a portion thereof extending through a side wall of said casing of said support means and defining a supporting hook for engagement by said spray gun, said switches being normally closed switches forced to assume a circuit open condition by their associated levers upon engagement of said levers by said spray devices.

4,092,137

GAS-ENTRAINED LIQUID SEPARATING MEANS WITH DUAL HOUSING

Frank D. Howe, Painted Post, N.Y., and Lee Max Hoppe, Davidson, N.C., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Sep. 21, 1977, Ser. No. 835,158
Int. Cl.² B01D *45/16*
U.S. Cl. 55—337 **10 Claims**



1. Means for separating liquid from a gas which has liquid entrained therein, comprising:

a tank;

said tank having a vertical housing and a horizontal housing;

said housings defining an interface by means of a wall common to both housings;

first means for admitting gas into said vertical housing;

second means within said vertical housing, and communicating with said first means, for conducting gas through said vertical housing for communication thereof with said horizontal housing;

third means for discharging gas from said horizontal housing;

means within said horizontal housing, and communicating with said second means, for conducting gas through said horizontal housing to said third means; wherein

said second means comprise means for causing gas conducted through said vertical housing to move in circular paths, to cause entrained liquid to separate from therethrough-conducted gas; and

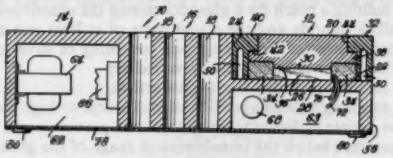
said horizontal housing has means therewithin for separating entrained liquid from therethrough-conducted gas.

4,092,138

DENTAL DESK UNIT

Shlomo Beitner, Tel-Aviv, Israel, assignor to Bipol Ltd., Tel-Aviv, Israel

Filed Jul. 26, 1976, Ser. No. 708,570
Int. Cl.² F25B *21/02, 29/00*; B26B *21/24*
U.S. Cl. 62—3 **19 Claims**



1. A dental desk unit comprising a hot section of heat-conducting material, a cold section of heat-conducting material, insulating material separating said hot and cold sections, and a thermoelectric unit of the Peltier type having a hot face and a cold face, said thermoelectric unit being imbedded in said insulating material with its hot face in heat-transfer contact with said hot section and its cold face in heat-transfer contact with said cold section, wherein said hot section has an upwardly-facing, horizontally-disposed hot plate exposed to the ambient atmosphere and a substantial mass of said heat-conducting material between said hot plate and the hot face of said thermoelectric unit, wherein the thermoelectric element is energized by a self-contained power pack comprising a transformer, a rectifier, and a condenser, wherein the hot section has a recess beneath the hot plate thereof, wherein the heat-generating elements of said power pack are located in said recess, and wherein said hot face is separated from said recess by said heat-conducting material whereby the heat generated by the heat-conducting elements is conducted from said recess to said hot face.

4,092,139

PROCESS FOR MAKING COLORED PHOTOSENSITIVE GLASS

Joseph Ference, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 16, 1977, Ser. No. 778,160
Int. Cl.² C03C *15/00*; C03B *32/00*; C03C *3/04*
U.S. Cl. 65—30 R **14 Claims**

1. A method for making a glass article wherein at least a portion thereof is integrally colored by silver which consists of the steps:

(a) melting a batch for a glass containing the constituents of alkali fluoride and the constituents of at least one silver halide selected from the group consisting of silver chloride, silver bromide, and silver iodide;

(b) forming said melt into a glass article;

(c) exposing at least a portion of said article at ambient temperature to high energy or actinic radiation;

(d) heating at least said exposed portion of said article to a temperature between about the transformation range of the glass and the softening point thereof for a sufficient length of time to cause nucleation and growth of microcrystals of alkali fluoride containing at least one silver halide selected from the group consisting of silver chloride, silver bromide, and silver iodide;

(e) re-exposing at least said portion of said glass article to high energy or actinic radiation while at least said portion is at a temperature below the transformation range of the glass that is at a temperature between about 200° –410° C. for a sufficient length of time to cause metallic silver to be deposited as discrete colloidal particles less than 200A in the smallest dimension, and/or deposited within said microcrystals, the silver-containing part of the microcrystal being less than about 200A in the smallest dimension, and/or deposited on the surface of said microcrystals, the

portion of the microcrystal coated with silver being less than about 200A in the smallest dimension, said microcrystals having a concentration of at least 0.005% by volume; and then

(f) cooling said article to ambient temperature.

8. A method for making a glass article wherein at least a portion thereof is integrally colored by silver which consists of the steps:

(a) melting a batch for a glass containing the constituents of alkali fluoride and the constituents of at least one silver halide selected from the group consisting of silver chloride, silver bromide, and silver iodide;

(b) forming said melt into a glass article;

(c) exposing at least a portion of said article to high energy or actinic radiation while at least said portion is at a temperature below the transformation range of the glass that is at a temperature between about 200°–410° C. for a sufficient length of time to develop a latent image therein.

(d) removing the high energy or actinic radiation and subjecting at least said portion of said article to a temperature between the transformation range and the softening point of the glass for a period of time sufficient to cause nucleation and growth of microcrystals of alkali fluoride containing at least one silver halide selected from the group consisting of silver chloride, silver bromide, and silver iodide;

(e) re-exposing at least said portion of said article to high energy or actinic radiation while at least said portion is at a temperature below the transformation range of the glass that is at a temperature between about 200°–410° C. for a sufficient length of time to cause metallic silver to be deposited as discrete colloidal particles less than 200A in the smallest dimension, and/or deposited within said microcrystals, the silver-containing part of the microcrystal being less than about 200A in the smallest dimension, and/or depositied on the surface of said microcrystal, the portion of the microcrystal coated with silver being less than about 200A in the smallest dimension, said microcrystals having a concentration of at least 0.005% by volume; and then

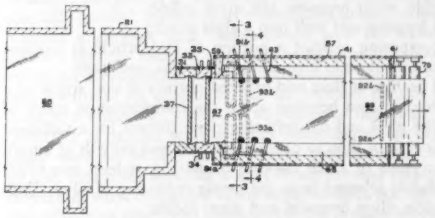
(f) cooling said article to ambient temperature.

4,092,140

APPARATUS AND METHOD USING HEAT PIPES FOR MANIPULATING TEMPERATURE GRADIENTS IN A GLASS FORMING CHAMBER

Richard L. Cerutti, Seminole; Vincent I. Henry, New Kensington, and John E. Sensi, Arnold, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 8, 1976, Ser. No. 721,243
Int. Cl.² C03B *18/02*
U.S. Cl. 65—99 A **37 Claims**



1. In a glass forming chamber comprising an elongated enclosure containing a pool of molten metal extending lengthwise of the enclosure for supporting glass, said pool of molten metal comprising a longitudinally extending centrally disposed high temperature region and adjacent longitudinally extending edge regions of lower temperatures which produce temperature differences in a direction transverse to the longitudinal axis of the chamber, means for delivering a layer of molten glass onto the pool of molten metal, means for advancing the glass along the surface of the pool of molten metal, means for cooling and applying forces to the advancing glass to make a continuous sheet of glass and means for removing a continuous sheet of glass from the chamber, the improvement which comprises a heat pipe disposed in heat transfer relationship with said pool of molten metal, said heat pipe comprising a sealed conduit having therein a vapor space, a condensable working fluid space and a wick member extending between said spaces, at least one portion of said conduit in which said condensable working fluid space is located being in heat transfer relation to a high temperature region of said pool of molten metal and at least one portion of said conduit in which said vapor space is located being in heat transfer relation to a low temperature region of said pool of molten metal, whereby the temperatures in said pool of molten metal in a direction transverse to a longitudinal axis of said chamber and along which said heat pipe is located are maintained more uniform.

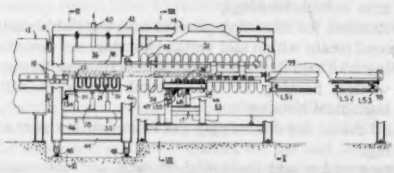
37. In a method of manufacturing glass wherein a layer of molten metal in an enclosed forming chamber and the delivered glass is advanced along the surface of the pool of molten metal and is cooled and subjected to forces while advancing to form a continuous dimensionally stable sheet of glass, the improvement which comprises transferring heat from relatively hotter portions of the advancing glass to relatively colder portions of the advancing glass by disposing at least one heat pipe in the forming chamber such that the heat pipe, comprising a sealed conduit having therein a vapor space, a condensable working fluid space and a wick member extending between the spaces, has at least one first portion of said conduit in which the condensable working fluid space located in heat transfer relation to a high temperature region of the forming chamber adjacent such relatively hotter portions of the advancing glass and has at least one second portion of said conduit in which the vapor space located in heat transfer relation to a low temperature region of the forming chamber adjacent such relatively colder portions of the advancing glass and vaporizing a working fluid at said first portion of heat pipe adjacent such relatively hotter portions, conveying the vaporized working fluid through the heat pipe to said second portion of the heat pipe adjacent such relatively colder portions, condensing the conveyed vaporized working fluid at such second portion of the heat pipe and conveying the condensed working fluid through the heat pipe back to such first portion of the heat pipe.

4,092,141

METHOD AND APPARATUS FOR HANDLING GLASS SHEETS FOR SHAPING AND COOLING

Robert G. Frank, Murrysville, and DeWitt W. Lampman, Monroeville, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 3, 1977, Ser. No. 756,208
Int. Cl.² C03B *23/02, 27/00*
U.S. Cl. 65—114 **8 Claims**



1. A method of tempering a bent glass sheet comprising:

in a bending station, depositing a heated, newly bent glass sheet onto a horizontally disposed support ring conforming in outline and elevation to marginal portions of the bent glass sheet;

transferring the bent glass sheet on the support ring from the bending station into a first portion of a tempering station

wherein blasts of tempering medium are directed onto the sheet to initiate tempering thereof;

after surface portions of the sheet have been cooled sufficiently to resist scuffing and marking but before tempering is completed, lifting the sheet off the support ring by bringing a set of spaced elevator rolls into contact with the underside of the sheet within the outline of the support ring and providing relative vertical motion between the support ring and the elevator rolls to thereby support the sheet on the elevator rolls at an elevation above the upper extent of the support ring and in alignment with a roll conveyor extending into a second portion of the tempering station;

rotating the elevator rolls to convey the sheet onto the roll conveyor and into the second portion of the tempering station;

applying blasts of tempering medium onto the sheet in the second portion of the tempering station to complete tempering of the sheet;

and after the sheet has entered the second portion of the tempering station, restoring the relative elevations of the elevator rolls and the support ring to locate the elevator rolls below the lower extent of the support ring and translating the support ring out of the tempering station toward the bending station to receive a subsequent bent glass sheet.

7. Apparatus for tempering bent glass sheets, comprising:

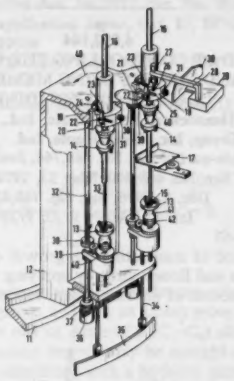
a tempering station adjacent to a glass sheet bending station, a horizontally disposed support ring conforming in outline and elevation to marginal portions of a bent glass sheet to enable said sheet to be supported thereon, means for reversibly moving the support ring between the bending station and a first portion of the tempering station, said first portion and a second portion of the tempering station each having upper and lower sets of nozzles for directing blasts of tempering medium onto opposite sides of a glass sheet being conveyed therebetween, said first portion including an elongated opening between said upper and lower sets of nozzles for receiving the support ring and a bent glass sheet resting thereon along a generally horizontal path of travel, said second portion including a roll conveyor between said upper and lower sets of nozzles for supporting and horizontally conveying a bent glass sheet therebetween along a second path of travel at a higher elevation than said first path of travel, a set of elevator rolls within the first portion of the tempering station at a location adjacent to the second portion of the tempering station and lying directly below said horizontal path of travel of the support ring so as to be periodically vertically aligned within the outline of the support ring and in alignment with said roll conveyor, vertical reciprocator means for reversibly bringing the upper extent of the elevator rolls above the upper extent of the support ring within the outline of the support ring so as to lift a glass sheet from the support ring into alignment with the upper surface of said roll conveyor, means to rotate the elevator rolls in unison to convey a glass sheet lifted from the support ring onto said roll conveyor and into the second portion of the tempering station, whereby tempering of the glass sheet initiated in said first portion may be completed in said second portion while the support ring is being returned toward the bending station.

4,092,142
MACHINE FOR MAKING CONTAINERS FROM GLASS TUBES

Hans-Joachim Dichter, Berlin, Germany

Filed Jan. 13, 1977, Ser. No. 758,934
Claims priority, application Germany, Jan. 23, 1976, 2602944
Int. Cl.² C03B *23/12*
U.S. Cl. 65—159 **8 Claims**

1. A machine for making containers from glass tubes including several chucks, means for circulating said chucks through a succession of processing stations, each chuck having jaws to grip a glass tube or container, and means for bringing said chucks successively into a position in which they are superposed above a stationary supporting plate at at least one processing station, said plate limiting the downwards movement of the length of tube which falls downwards through said chuck, characterised in that the said chucks move up and down on at least one circulating column, the processing station which has the supporting plate being equipped with a senser

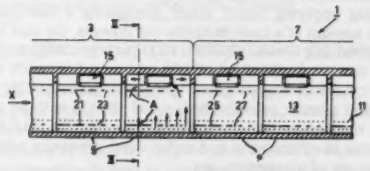


which triggers a releasing device said releasing device comprising means for releasing said chuck which has reached said processing station and moving said chuck downwards, said senser responding to the absence of a tube above the upper surface of said jaws of said chuck by actuating said releasing means which initiates said downwards movement of said chuck wherein said chuck moves into a position in which it can securely grip said tube.

4,092,143
TUNNEL FURNACE FOR THE THERMAL TREATMENT OF GLASS PRODUCTS

Theodorus Cornelis Groot, Eindhoven, and Arie Cornelis Vliegenthart, Aalst, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 616,135, Sep. 23, 1975, abandoned.
This application Feb. 7, 1977, Ser. No. 766,145
Claims priority, application Netherlands, Sep. 24, 1974, 7412568
Int. Cl.² C03B *25/04*
U.S. Cl. 65—351 **1 Claim**



1. A tunnel furnace for the thermal treatment of an associated article which comprises: a housing defining a tunnel which includes a plurality of zones, each zone having an inlet and an outlet for the associated article, the inlet for the associated article for each zone after the first zone being the outlet of the preceding zone, a transport apparatus for the transport of the associated articles in a longitudinal direction through said tunnel from an inlet side to an outlet side of each successive zone, each zone extending over longitudinal section of said tunnel, means for generating an airflow in a direction transverse to the longitudinal direction of the tunnel with each zone

and means for controlling the temperature of the airflow in each zone, said housing including first and second walls having therein flow apertures, said first and second walls in any one zone being disposed in opposed relationship, each of said walls being disposed in generally parallel relationship to said longitudinal direction, the total area of the flow apertures on opposed sides of any one zone being equal, the area of the flow apertures in each zone being inversely related to the longitudinal distance from said outlet of said zone.

4,092,144

METHOD OF CONTROLLING THE GROWTH OF ALGAE AND VIRUSES USING MEMBERS OF THE CLASS OF OXAZOLIDINES

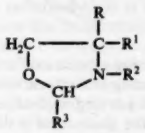
Jerry Hoyt Hunsucker, Terre Haute, Ind., assignor to IMC Chemical Group, Inc., Terre Haute, Ind.

Continuation-in-part of Ser. No. 588,744, Jun. 20, 1975, which is a division of Ser. No. 469,200, May 13, 1974. This application Dec. 8, 1976, Ser. No. 748,429

Int. Cl.² A01N *9/22, 9/28*

U.S. Cl. 71—67 **4 Claims**

1. A method of combatting the growth of algae and New Castle's virus and Boney virus by applying thereto a growth-inhibiting amounts of an oxazolidine represented by the formula:



wherein R and R^1 are hydrogen or alkyl of 1 to 2 carbon atoms and can be the same or different; R^2 is hydrogen or alkyl of 1 to 3 carbon atoms; R^3 is hydrogen or alkyl of from 1 to 3 carbon atoms.

4,092,145

METHOD OF PROLONGING THE LIFE OR BEAUTY OF CUT FLOWERS

John Wesley Willard, Sr., Rapid City, S. Dak., assignor to Caw Industries, Inc., Rapid City, S. Dak.

Continuation-in-part of Ser. No. 593,712, Jul. 7, 1975, which is a continuation-in-part of Ser. No. 317,097, Dec. 20, 1972, Pat. No. 3,893,943, which is a continuation of Ser. No. 108,198, Jan. 20, 1971, abandoned. This application Dec. 14, 1976, Ser. No. 750,393

Int. Cl.² A01N *3/02*

U.S. Cl. 71—68 **22 Claims**

1. A method of prolonging the life or beauty of cut flowers comprising applying liquid water containing a catalytically effective amount of a catalyst to the cut flowers, the said liquid water containing about 0.000001–1000 parts per million of the catalyst when calculated by weight and on a dry solids basis, the said catalyst being prepared by a process comprising

admixing a water soluble alkali metal silicate with an aqueous medium containing a dissolved substance which is a source of calcium ion and a dissolved substance which is a source of magnesium ion,

the aqueous medium containing said dissolved substances in amounts to provide between about 1×10^{-4} and 1×10^{-1} mole per liter each of calcium ion and magnesium ion,

the aqueous medium containing said dissolved substances in amounts to provide a molar ratio of calcium ion to magnesium ion between about 2.0:1.0 and 1.0:2.0,

the alkali metal silicate having an alkali metal oxide to silicon dioxide ratio between about 0.9:1.0 and less than 2.0:1.0 and being admixed with the aqueous medium in an amount of about 0.05–2 moles per liter,

reacting the alkali metal silicate with said dissolved substances providing calcium ion and magnesium ion to produce an aqueous suspension of finely divided particles of the reaction product,

admixing a micelle-forming surfactant with the aqueous medium in an amount to form catalyst micelles comprising said finely divided particles upon agitating the aqueous medium, and

agitating the aqueous medium containing the finely divided particles and surfactant to form said catalyst micelles.

4,092,146

COMPOSITIONS, METHODS AND NEW COMPOUNDS FOR INFLUENCING PLANT GROWTH

Hanspeter Fischer, Bottmingen, and Daniel Bellus, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

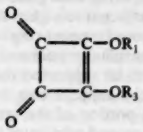
Filed Apr. 7, 1976, Ser. No. 674,708

Claims priority, application Switzerland, Apr. 18, 1975, 4995/75; May 30, 1975, 6996/75

Int. Cl.² A01N *9/24*

U.S. Cl. 71—70 **12 Claims**

1. A method for controlling the growth of weeds which comprises applying thereto a herbicidally effective amount of a compound of the formula



in which

R_1 is alkyl of from 1 to 12 carbon atoms; or alkyl of from 1 to 12 carbon atoms substituted by fluorine, chlorine, bromine or methoxy; and

R_3 is a hydrogen ion, an equivalent metal cation or a group falling within the definition of R_1.

4,092,147

METHOD FOR CONTROLLING THE RELATIVE STEM GROWTH OF PLANTS

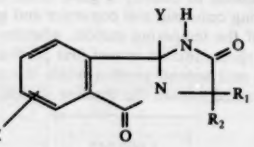
Saleh Abdul-Kadir Ashkar, Madison, Wis., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 631,359, Nov. 12, 1975, Pat. No. 4,067,718. This application Sep. 9, 1977, Ser. No. 831,842

Int. Cl.² A01N *9/22*

U.S. Cl. 71—76 **12 Claims**

1. A method for controlling the relative stem growth of plants comprising treating the plants with a compound of the formula:



wherein X represents H, CH_3 Cl, OCH_3, SCH_3 or NO_2; R_1 and R_2 each represent alkyl C_1–C_4, provided that the sum of the carbon atoms in the groups represented by said R_1 and R_2 is 4 to 7, and when R_1 and R_2 are taken together with the carbon to which they are attached, they may represent cycloalkyl C_5–C_6 optionally substituted with CH_3; and Y is hydrogen, including the optical and stereoisomers thereof; in an amount sufficient to increase or reduce the relative stem length of the treated plant.

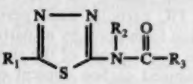
4,092,148

AMIDE DERIVATIVES OF 1,3,4-THIADIAZOLES

Tony Cebalo, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 17, 1970, Ser. No. 12,135
Int. Cl.[2] A01N *9/12*
U.S. Cl. 71—90 24 Claims

1. A herbicidal composition comprising a carrier and a herbicidal amount of at least one compound having the general formula:



wherein

R_1 is trifluoromethyl, chlorodifluoromethyl or pentafluoroethyl,

R_2 is hydrogen or C_1–C_4 alkyl, and

R_3 is hydrogen, C_1–C_4 alkyl, C_1–C_4 haloalkyl or cyclopropyl, the halogen being fluorine, chlorine or bromine.

4,092,149

METHOD OF INCREASING THE YIELD OF COTTON PLANTS

Samuel David Van Hoogstraten, Cambridge, England, assignor to Fisons Limited, London, England

Filed May 10, 1977, Ser. No. 795,552
Claims priority, application United Kingdom, May 15, 1976, 20146/76
Int. Cl.[2] A01N *9/12*
U.S. Cl. 71—90 10 Claims

1. A method of increasing the yield of cotton plants, in which (3-phenyl-1,2,4-thiadiazol-5-ylthio)acetic acid, or a salt, an ester formed with an alkanol of 1 to 10 carbon atoms, or the amide thereof is applied in an effective amount to the locus at which the plants are growing.

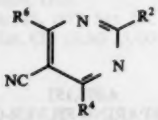
4,092,150

HERBICIDAL 5-PYRIMIDINECARBONITRILES

Gino R. Treves, Princeton, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 718,224, Aug. 27, 1976, abandoned. This application Jun. 30, 1977, Ser. No. 811,917
Int. Cl.[2] A01N *9/22*; C07D *239/34*
U.S. Cl. 71—92 22 Claims

3. A chemical compound having the structural formula



wherein

(a) R^2 is a radical selected from amino, lower alkylamino, lower cycloalkylamino, di(lower alkyl)amino, and amino;

(b) R^4 is a lower alkoxy radical; and

(c) R^6 is a radical selected from amino, lower alkylamino, lower cycloalkylamino, and di(lower alkyl)amino;

with the proviso that neither R^2 nor R^6 is tert-butylamino; and provided further that when R^2 is isopropylamino, R^6 is other than n-butylamino; and when R^2 is methylethylamino, R^6 is other than isopropylamino; and when R^2 is diethylamino, R^6 is other than amino.

9. An herbicidal composition comprising an herbicidally effective amount of at least one of the chemical compounds of claim 3 in admixture with an agriculturally acceptable carrier and a surfactant.

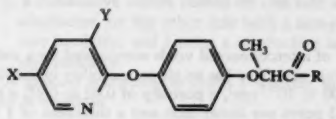
4,092,151

HERBICIDAL COMPOUND, HERBICIDAL COMPOSITION CONTAINING THE SAME AND METHOD OF USE THEREOF

Ryohei Takahashi, Kusatsu; Kanichi Fujikawa, Kyoto; Isao Yokomichi, Kusatsu; Yasuhiro Tsujii, Kusatsu, and Nobuyuki Sakashita, Kusatsu, all of Japan, assignors to Ishihara Sangyo Kaisha, Ltd., Osaka, Japan

Division of Ser. No. 623,517, Oct. 17, 1975, Pat. No. 4,046,553. This application Jun. 10, 1977, Ser. No. 805,386
Claims priority, application Japan, Oct. 17, 1974, 49-118676; Mar. 13, 1975, 50-29556
Int. Cl.[2] A01N *9/22*; C07D *213/64*
U.S. Cl. 71—94 7 Claims

1. A compound having the general formula (I):



(I)

wherein X is a halogen atom, Y is a hydrogen atom, a halogen atom or a methyl group, and R is an amino group which may be substituted with one or more of a (C_1–C_4) alkyl group in which the alkyl moiety thereof may be straight or branched chain and may be substituted with a hydroxy group.

4,092,152

VOLATILIZATION OF IMPURITIES FROM SMELTER REVERTS

Gyula John Borbely, Copper Cliff, Canada, assignor to The International Nickel Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 669,854, March 24, 1976, abandoned. This application Aug. 3, 1977, Ser. No. 821,470
Claims priority, application Canada, Apr. 25, 1977, 276851, May 12, 1975 226684
Int. Cl.[2] C22B *1/08*
U.S. Cl. 75—7 8 Claims

1. A process for treating a finely divided residue containing at least about 1.5%, by weight, of sulfur and at least one metal value from the group consisting of copper, silver, cobalt, iron, nickel, gold, and precious metals to remove therefrom at least one impurity from the group consisting of Cd, Bi, Re, Pb, Mo, Sn, Sb, Zn, and As which comprises: pelletizing said residue; and heating said pelletized residue at a temperature of about 800° C to about 1150° C in an atmosphere containing chlorine in an amount of about 0.1 percent to about 5 percent, by weight, of said residue and about 8% to about 20% by volume of sulfur dioxide to volatilize said impurities and provide a treated residue containing at least about 1 weight percent sulfur enhanced in said metal value content.

4,092,153

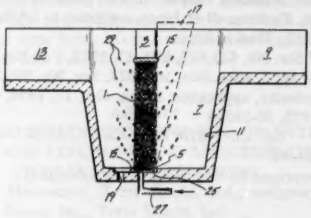
FILTERING AND INLINE DEGASSING OF MOLTEN METAL

John C. Yarwood, Madison, Conn.; James E. Dore, Ballwin, Mo., and Robert K. Preuss, Middletown, Conn., assignors to Swiss Aluminium Limited, Chippis, Switzerland

Division of Ser. No. 820,094, Jul. 29, 1977, which is a continuation-in-part of Ser. No. 727,902, Sep. 30, 1976, abandoned, which is a division of Ser. No. 747,571, Dec. 6, 1976, Pat. No. 4,052,198, which is a division of Ser. No. 654,724, Feb. 2, 1976, Pat. No. 3,947,363, which is a division of Ser. No. 597,963, Jul. 21, 1975, Pat. No. 4,024,056. This application Aug. 24, 1977, Ser. No. 827,251
Int. Cl.[2] C22B *21/00*
U.S. Cl. 75—68 R 8 Claims

1. A method for the degassing and filtration of molten metal which comprises passing said molten metal through a chamber wherein said metal travels through at least one vertically disposed filter plate and is brought into contact with a fluxing gas while traveling through said filter plate wherein said fluxing

gas issues from an inlet provided within said chamber beneath said filter plate and percolates through said filter plate to contact said molten metal wherein said plate comprises a ceramic foam filter having an open cell structure characterized



by a plurality of interconnected voids surrounded by a web of ceramic wherein said filter has an air permeability in the range of 400 to 8,000 $\times 10^{-7}$ cm^2, a porosity of 0.80 to 0.95, a pore size of 5 to 45 pores per linear inch and a thickness of $\frac{1}{2}$ to 4 inches.

4,092,154

ALUMINUM CONTAINING PRECIPITATING AGENT FOR PRECIOUS METALS AND METHOD FOR ITS USE

George Dietz, Jr., Watertown, Conn., and Robert M. Skomoroski, Paterson, N.J., assignors to American Chemical & Refining Co., Inc., Waterbury, Conn.

Filed Sep. 2, 1976, Ser. No. 719,805
Int. Cl.[2] C22B *3/00*
U.S. Cl. 75—109 **22 Claims**

15. A method for the precipitation of precious metal ions from aqueous alkaline solution of said ions and for reducing the cyanide content, if any, of the solution comprising the steps of:

a. heating an aqueous alkaline solution of precious metal ions to a temperature of at least about 37.7° C;

b. adding to said solution a precipitating agent comprising an admixture of aluminum powder and a reducing agent selected from the class consisting of alkali metal hydrosulfite, alkali metal borohydride and hydrazine compounds to precipitate elemental precious metal; and

c. separating precipitated precious metal from the solution.

4,092,155

MACHINES FOR THE CASTING OF METALS

John M. Dompas, Olen, Belgium, and Charles J. Petry, Winooski, Vt., assignors to Metallurgie Hoboken-Overpelt, Brussels, Belgium

Filed Jul. 18, 1974, Ser. No. 489,655
Claims priority, application France, Jul. 25, 1973, 73 27166
Int. Cl.[2] C22C *38/50*
U.S. Cl. 75—124 **1 Claim**

1. A casting belt for machines for the casting of metals, said casting belt consisting of steel consisting essentially of in percent by weight less than 0.03 phosphorous, less than 0.03 sulphur, 0.06 carbon, 0.02 to 0.05 aluminum, 0.15 to 0.4 manganese, 0.07 to 0.11 chromium, less than 0.002 silicon, 0.03 to 0.05 nickel, 0.4 titanium, and the balance iron, and said steel has a rupture strength of 60 to 90 kg/mm^2 and an elongation of rupture of 2 to 15%.

4,092,156

PROCESS FOR PREPARING TITANIUM CARBIDE BASE POWDER FOR CEMENTED CARBIDE ALLOYS

Yoshinobu Kobayashi, 3599-73, Honmachida, Machida-shi, Tokyo, Japan

Filed Nov. 23, 1976, Ser. No. 744,455
Int. Cl.[2] B22F *1/00*
U.S. Cl. 75—203 **8 Claims**

1. A process for preparing a titanium carbide base powder for cemented carbide alloys comprising the steps of molding a mixture of TiC powder starting material and an amount of binder metal powder required for sintering the TiC material, the TiC material having a combined carbon content lower than the theoretical value and containing free carbon; sintering the molded mixture by heating the mixture at a temperature of about 1550° to 2500° C under conditions inert to TiC; maintaining the sintered product at said high temperature for a time sufficient to fully deoxidize from the surface of the TiC particles, thereby rendering the TiC particles highly compatible with the binder metal, causing the binder metal to fuse onto the surface of the TiC particles while permitting the binder metal to vaporize and form pores by its partial pressure within the resulting binder metal phase of the sintered product and increasing the combined carbon content of the TiC to the highest possible value approximate to the theoretical value; and crushing the sintered product after cooling the product to thereby obtain a powder composed of TiC particles having the highest possible content of combined carbon approximate to the theoretical value, provided with binder metal fused to the surface of the particles with high strength and exhibiting high amenability of sintering.

7. A process for preparing a titanium carbide base powder for cemented carbide alloys comprising the steps of molding a mixture of TiC powder starting material, an amount of binder metal powder required for sintering the TiC material and a sintering reaction accelerating agent, the TiC material having a combined carbon content lower than the theoretical value; sintering the molded mixture by heating the mixture at a high temperature of 1500° to 2500° C under conditions inert to TiC; maintaining the sintered product at the high temperature to fully deoxidize the surface of the TiC particles and to thereby render the TiC particles highly compatible with the binder metal, causing the binder metal to fuse onto the surface of the TiC particles while permitting the binder metal to form pores by its partial pressure within the resulting binder metal phase of the sintered product; and crushing the sintered product after cooling the product to thereby obtain a powder composed of TiC particles having the highest possible content of combined carbon approximate to the theoretical value, provided with binder metal fused to the surface of the particles with high strength and exhibiting high amenability to sintering.

4,092,157

PROCESS FOR PREPARING SILVER-CADMIUM OXIDE ALLOYS

F. Joseph Reid, Acton, and Han J. Kim, Chelmsford, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Sep. 10, 1976, Ser. No. 722,855
Int. Cl.[2] B22F *3/00*
U.S. Cl. 75—206 **13 Claims**

1. The process for preparing a silver-cadmium oxide alloy which comprises heating a compact of silver-cadmium oxide at from about 750° C to about 850° C, and thereafter heating at an elevated temperature of about 900° C.

8. A process for preparing a silver-cadmium oxide alloy which comprises forming a compact of silver particles and cadmium oxide particles, heating said compact at from about 750° C to about 850° C, and thereafter further heating said heated compact at an elevated temperature of about 900° C.

4,092,158

SPRAY POWDER FOR THE MANUFACTURE OF LAYERS HAVING HIGH RESISTANCE TO WEAR AND BURN TRACES

Horst Beyer, and Ulrich Buran, both of Burscheid, Germany, assignors to Goetzewerke Friedrich Goetze AG, Burscheid, Germany

Filed Nov. 28, 1975, Ser. No. 636,224
Claims priority, application Germany, Nov. 28, 1974, 2456238
Int. Cl.[2] B22F 1/00
U.S. Cl. 75—254 15 Claims

1. In a spray powder for the manufacture of a coating having a high resistance to wear and burn traces on the bearing surface of an engine part which is subject to friction, the improvement wherein the spray powder consists essentially of a powder mixture of about 30 to about 80 weight percent iron, about 0.1 to about 60 weight percent of at least one Group VIB metal selected from the group consisting of molybdenum and tungsten, and about 7.35 to about 50 weight percent boron.

4,092,159

FLUX FOR METAL CASTING

Joseph F. Uber, Timonium, Md., assignor to SCM Corporation, Cleveland, Ohio

Filed Jun. 17, 1977, Ser. No. 807,465
Int. Cl.[2] C22B 9/10
U.S. Cl. 75—257 7 Claims

1. In a process for producing a flux suitable for use in the continuous casting of metal from raw materials comprising a glass network former, a fluxing agent therefor and a fluorine-providing material adapted for vitrification with said network former and said fluxing agent, the improvement which comprises:

(A) smelting together the vitrifiable raw materials for said flux, but not more of said fluorine-providing material than corresponds to about 5% by weight of fluorine, to form a molten glass;

(B) cooling said molten glass to form a vitrified frit therefrom; and

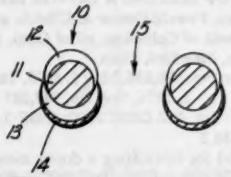
(C) blending particles of said vitrified frit with discrete unvitrified particles of said fluorine-providing material to form said flux comprising the vitrified frit particles and the discrete unvitrified particles of fluorine-providing material.

4,092,160

ION MODULATOR HAVING BIAS ELECTRODE FOR REGULATING CONTROL FIELDS

Jerome E. Jackson, Shaker Heights, and John D. Blades, Chagrin Falls, both of Ohio, assignors to Addressograph-Multigraph Corp., Cleveland, Ohio

Filed Mar. 25, 1975, Ser. No. 561,681
Int. Cl.[2] G03G 13/00
U.S. Cl. 96—1 R 11 Claims



1. A process for producing a latent electrostatic image corresponding to a graphic original upon a dielectric surface which comprises

creating fringing fields in the apertures of an ion modulator situated between a source of ions of a certain polarity and said dielectric surface, said fringing fields having a polarity to block the passage of ions of said certain polarity through said modulator and resulting from a potential applied to an insulating layer of said modulator, and

projecting ions of said certain polarity from said source towards said modulator and said dielectric surface while simultaneously exposing said modulator to a pattern of light and dark areas corresponding to said original, whereby said ions are selectively passed through said modulator and deposited upon said dielectric surface to form a latent electrostatic image corresponding to said original, said modulator comprising a member selected from the group consisting of

a. a conductive screen coated with a photoconductor and having a conductive layer on one side of said photoconductor, and

b. a conductive screen coated on one side with a photoconductor, on the other side with a non-photoconductive insulator, and having a conductive layer adjacent said insulator.

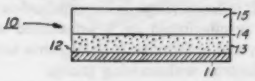
5. A process according to claim 1 wherein said photoconductor is selenium.

4,092,161

INORGANIC PHOTOCONDUCTORS WITH PHENYL SUBSTITUTED IMAGE TRANSPORT MATERIALS

Richard W. Radler, Jr., Penfield; Richard P. Millonzi, Marion, and John A. Bergfjord, Macedon, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 346,393, Mar. 30, 1973, abandoned, which is a continuation-in-part of Ser. No. 192,898, Oct. 27, 1971, abandoned. This application Jan. 6, 1975, Ser. No. 538,637
Int. Cl.[2] G03G 5/24
U.S. Cl. 96—1.5 R 14 Claims



1. An imaging member comprising a layer of an inorganic crystalline compound or an inorganic photoconductive glass as photoconductive material and a contiguous layer of an electronically active organic material overlaying the photoconductive layer, said photoconductive layer exhibiting the capability of photo-excited hole generation and injection, the overlaying active organic material being transparent to the radiation absorbed by the photoconductive layer and capable of supporting the injection of photo-excited holes from the photoconductive layer and transporting said holes, wherein the overlaying active organic material is at least one material selected from the group consisting of a 3-phenylbenzo furan, 2-phenylbenzofuran, 3-phenyl thiophene, 2-phenylbenzo thiophene, 1-phenylphenanthrene, 2-phenyltetracene, 1-phenylpyrene, 2-phenylpyrene, 4-phenylfluoranthene, 3-phenylfluoranthene, 3-phenylcarbazole, 4-phenylcarbazole, and corresponding polymers thereof, the ratio of thickness of the active organic material to the photoconductive layer being about 2:1 to 200:1.

4,092,162

NITROGEN CONTAINING POLYMERS AND USE IN PHOTOCONDUCTIVE ELEMENTS

Hal Eldon Wright, Rochester, and Martin Alfred Berwick, Kendall, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

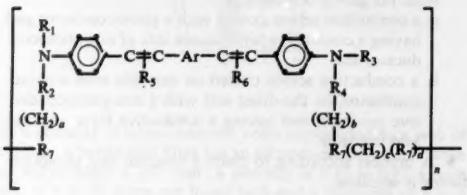
Filed Dec. 22, 1976, Ser. No. 753,389
Int. Cl.[2] G03G 5/07
U.S. Cl. 96—1.5 N 16 Claims

6. A photoconductive insulating element having at least two layers comprising an aggregate photoconductive layer in electrical contact with a photoconductor-containing layer, wherein:

(a) said photoconductor-containing layer, comprises a mate-

rial selected from the group consisting of inorganic and organic photoconductors;

(b) said aggregate photoconductive layer comprising (i) a continuous, electrically insulating polymer phase and (ii) a discontinuous phase dispersed in said continuous phase comprising a finely-divided, particulate co-crystalline complex of at least one polymer having an alkylidene diarylene group in a recurring unit and at least one pyrylium-type dye salt, and (iii) at least one compound having the structure:



wherein

R_1, and R_3, which may be the same or different, represent a substituted or unsubstituted alkyl group having from 1 to 18 carbon atoms or a substituted or unsubstituted aryl group;

R_2 and R_4, which may be the same or different, represent an alkylene group having from 2 to 10 carbon atoms or a substituted or unsubstituted arylene group;

R_5 and R_6 which may be the same or different, represent hydrogen or an electron withdrawing group;

R_7 can represent oxy, imino, thio, oxycarbonyl, iminocarbonyl, carbonyldioxy, ureylene, carbonyloxycarbonyl, sulfonyl, iminosulfonyl, iminocarbonyloxy;

Ar is an unsubstituted or a substituted arylene group wherein said substituent is an electron accepting group or an electron withdrawing group;

a, *b* and *c* are whole numbers of from 1 to 25;

d is 0 or 1; and

n is a whole number having a value of at least 2.

4,092,163

IMAGING PROCESS UTILIZING SILYLATED COATED CARRIER

Harry W. Gibson, Penfield, and Franklin D. Saeva, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 500,775, Aug. 26, 1974, Pat. No. 4,043,929. This application Mar. 21, 1977, Ser. No. 779,380

Int. Cl.² G03G *13/08, 9/10*

U.S. Cl. 96—15 D **9 Claims**

1. An electrostatographic imaging process comprising the steps of providing an electrostatographic imaging member having a recording surface, forming an electrostatic latent image on said recording surface, and contacting said electrostatic latent image with a developer mixture comprising finely-divided toner particles electrostatically clinging to the surface of carrier particles having an average particle diameter of between about 50 microns and about 1,000 microns, each of said carrier particles comprising a core surrounded by an outer coating of a copolymer selected from the group consisting of styrene-alkylmethacrylate and styrene-alkylacrylate wherein said copolymer has been modified to contain active hydrogen containing constituents and then exposed to silylation to provide carrier particles characterized as having controlled triboelectric charging properties between said toner particles and said carrier particles, whereby at least a portion of said finely-divided toner particles is attracted to and deposited on said recording surface in conformance with said electrostatic latent image.

4,092,164

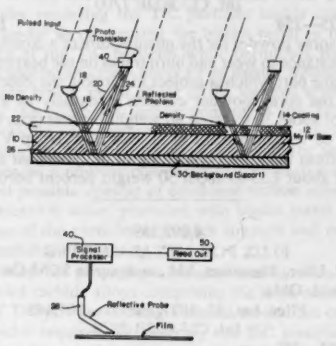
REFLECTANCE PROBE

Robert J. Crosby, Cleveland, Ohio, assignor to Horizons Incorporated a division of Horizons Research Incorporated, Cleveland, Ohio

Filed May 27, 1975, Ser. No. 581,084

Int. Cl.² G03C *5/04, 5/24*

U.S. Cl. 96—27 R **2 Claims**



1. In a process for monitoring the extent to which a background of fog develops in a non-silver free radical film in which an image is developed by blanket exposure of said film to radiant energy of a suitable wavelength after said film has been subjected to a latent image forming exposure by exposure to a pattern of radiation wherein said film comprises a clear base layer and a photosensitive coating on said base layer, the improvement which comprises:

while said image is being developed by said blanket exposure, traversing a non-image area of said film coating with radiation from a light emitting diode, acting as a probe and insufficient to produce any appreciable fogging of said film coating, said radiation being projected to strike said film coating at an angle so that one portion of the probe radiation is reflected from the interface between the film coating and the film base layer and a second portion is reflected from the interface between the film base layer and the surface on which the film base layer is supported;

providing radiation sensing means to receive the combination of both of said reflected radiations and to produce a signal indicative of the extent of fogging in said film coating, as a result of said exposure;

and causing said blanket exposure for development to be discontinued when the base plus fog reaches the desired level.

4,092,165

METHOD OF MAKING A DONOR MEMBER MOLD

Paul G. Andrus, Powell; Osmar A. Ullrich, and James M. Hardenbrook, both of Columbus, all of Ohio, assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 574,836, May 5, 1975. This application Dec. 3, 1976, Ser. No. 747,287

Int. Cl.² G03C *5/00;* G03F *5/00*

U.S. Cl. 96—38.2 **2 Claims**

2. A method for fabricating a donor member having a surface capable of supporting a layer of particulate latent image developing electroscopic powder, said surface having permanently disposed thereon a plurality of raised, discrete micro-pin self-spacing elements, which comprise;

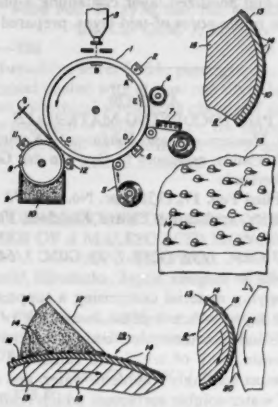
(a) exposing a layer of photo-hardenable material having a thickness of about 2.9 mils, coated on a substrate, through a transparency having a relatively uniform pattern of small clear dots of about 1.5 mils in diameter;

(b) removing the non-hardened portions of the layer to leave

the hardened, micro-pin elements permanently adhered to the substrate;

(c) electroplating a layer of a suitable material including nickel upon the micro-pin composite to form a mold;

(d) removing the micro-pin composite from the nickel mold;



(e) passivating the nickel mold;

(f) electroplating the nickel mold with a suitable material including nickel to form a donor member; and

(g) separating the donor member from said mold.

4,092,166

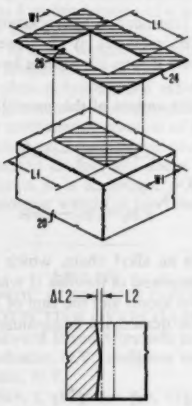
DOUBLE EXPOSURE AND DOUBLE ETCH TECHNIQUE FOR PRODUCING PRECISION PARTS FROM CRYSTALLIZABLE PHOTOSENSITIVE GLASS

Carlton Edward Olsen, San Jose, and Leroy Jasper Serpa, Campbell, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,463

Int. Cl.[2] G03C *5/00*

U.S. Cl. 96—38.2 **12 Claims**



1. A process for precision etching a photosensitive glass material comprising the steps of:

exposing a selectively crystallizable photosensitive glass substrate through a first mask to a source of radiation to which said photosensitive glass is sensitive;

heat treating said substrate by heating to a temperature sufficient to produce a crystalline phase within the part of the substrate exposed through said first mask to said radiation;

treating the substrate with an etchant to remove the crystalline phase part of said substrate, said treating step producing a taper at the boundary of the crystalline phrase material and the unexposed part of said substrate;

exposing the substrate through a second mask to a source of radiation to which said substrate is sensitive; said second mask having an incrementally larger opening than corresponding openings in said first mask;

heat treating said substrate by heating to a temperature at which the substrate produces a crystalline phase in the area exposed to said radiation; and

treating the substrate with an etchant to remove the crystalline phase material to produce a precision etched part having an etched pattern with substantially reduced taper as compared to the taper resulting from said first treating step.

4,092,167

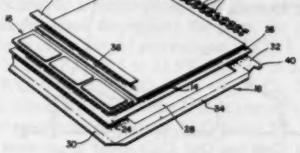
PHOTOGRAPHIC FILM UNIT WITH TAPS ON BINDING ELEMENT

Robert D. Bushey, Westboro, and Thomas P. McCole, South Natick, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 3, 1977, Ser. No. 756,503

Int. Cl.[2] G03C *1/48;* G03D *9/02*

U.S. Cl. 96—76 C **2 Claims**



1. In a diffusion transfer photographic film unit adapted to be processed to form a visible image by moving the film unit between pressure applying members to distribute a processing composition from the leading end to the trailing end thereof, said film unit comprising:

a photosensitive element;

an image receiving element in face to face relationship with said photosensitive element thereby forming an assembly having a leading and trailing end joined by lateral edges;

a quantity of processing composition releasably contained along the leading end of said assembly for distribution between said photosensitive and said image receiving elements in response to movement of said elements between a pair of pressure-applying members;

a trap having a leading and trailing edge affixed along the trailing end of said assembly for retaining excess processing composition; and

a binding element extending around at least the trailing end and lateral edges of the assembly and securing the photosensitive and image-receiving elements to one another in order to retain said sheets in superposition and prevent escape of processing composition from between the sheets wherein said binding element comprises an exposure aperture for exposing said photosensitive sheet therethrough, said exposure aperture comprising a leading and trailing edge;

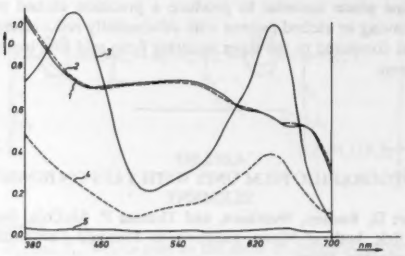
the improvement which comprises two tabs integral with said binding element, each of which is folded immediately adjacent a lateral edge of said film at a point adjacent and inboard the leading edge of the trap; and

whereby an increase in thickness of the binder element of the film unit is achieved adjacent the leading edge of the trap.

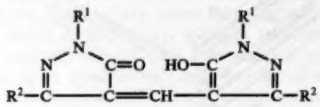
4,092,168
LIGHT-ABSORBING DYES FOR SILVER HALIDE MATERIAL

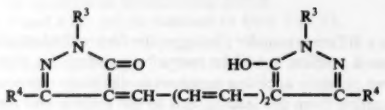
Raymond Gerard Lemahieu; Henri Depoorter, both of Mortsel, and Willy Joseph Vanassche, Kontich, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Dec. 17, 1976, Ser. No. 751,969
Claims priority, application United Kingdom, Jan. 16, 1976, 1797/76
Int. Cl.[2] G03C 1/84
U.S. Cl. 96—84 R 4 Claims



1. A light-sensitive photographic element comprising a support and at least one light-sensitive silver halide emulsion layer wherein the emulsion layer or an antihalation layer coated on either side of the support comprises a 5-pyrazolone-monomethine oxonol of formula I and a 5-pyrazolone-pentamethine oxonol of formula II:


I.


II.

wherein:

each of R^1 and R^3 represents an alkyl group or an aryl group,

each of R^2 and R^4 represents an alkyl group, an aryl group or the group COOR wherein R is alkyl or aryl, and

each dye molecule contains at least two carboxyl groups in their free acid form and further contains no solubilizing groups.

2. An element according to claim 1, wherein the dyes are present in an antihalation coating between the support and the emulsion layer.

4,092,169
ANODIZED ALUMINUM PHOTOGRAPHIC PLATES WITH SILVER BROMIDE IN PORES OF OXIDE LAYER, AND PROCESS OF MANUFACTURE THEREOF

Isao Kumasaka, Odawara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 231,000, Mar. 1, 1972. This application Mar. 12, 1974, Ser. No. 450,509
Claims priority, application Japan, Mar. 1, 1971, 46-10509
Int. Cl.[2] G03C 1/94
U.S. Cl. 96—86 R 14 Claims

1. In a method for manufacturing a photographic element of improved photosensitivity comprising applying a solution of silver nitrate to an anodized aluminum plate having an oxide layer containing pores therein on the surface of said plate and then applying a solution of an alkali metal bromide to said aluminum plate to incorporate silver bromide into the pores of said oxide layer, the improvement which comprises said solution of silver nitrate containing additionally aqueous ammonia in an amount such that the silver oxide precipitate initially formed just redissolves and disappears.

8. The photosensitive material comprising an anodized aluminum plate, said anodized layer containing a photosensitive silver bromide in the pores of said layer, prepared by the process of claim 1.

4,092,170
PHOTOCOPYING MATERIALS

Antonius H. I. Houtermans, and Johannes G. Kamphuis, both of Venlo, Netherlands, assignors to Oce-van der Grinten N.V., Venlo, Netherlands

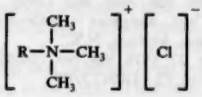
Filed Feb. 17, 1976, Ser. No. 658,473
Claims priority, application United Kingdom, Feb. 25, 1975, 07920/75
Int. Cl.[2] G03C 1/52; G03F 7/02; G03C 1/64, 1/68
U.S. Cl. 96—91 R 21 Claims

1. Photocopying material comprising a support carrying a light-sensitive layer which consists essentially of a negative-working, light-sensitive diazonium resin salt and an oleophilic, filmforming resin, both of which are soluble in organic solvents and at most sparingly soluble in water, and at least 10% by weight of water-soluble surfactant which renders said diazonium resin salt soluble in water so that said layer is developable into an image by plain water after imagewise exposure of said layer to light;

said resin salt being selected from the group consisting of p-toluene sulfonic acid, napththalene-2-sulfonic acid, BF_4- and 1-chloro-4-benzene sulfonic acid salts of the condensation product of p-diazo-diphenylamine and formaldehyde;

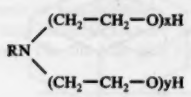
said surfactant being selected from the group consisting of:

a. alkyl-quaternary ammonium salts of the general formula


(I)

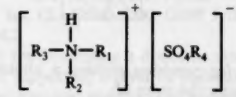
in which R represents a hydrocarbon chain, which salts comprise predominantly at least one compound of formula I wherein R is an alkyl chain having 12 to 18 carbon atoms;

b. ethylene oxide amines of the general formula


(II)

R represents an alkyl chain, which amines comprise at least one compound of formula II wherein the alkyl chain has 18 carbon atoms and the sum of x and y is 15;

c. water-soluble quaternary ammonium salts of the general formula



wherein R_1 and R_2 each is a methylol or ethylol group, R_3 is hydrogen or a methylol or ethylol group, and R_4 is an alkyl chain having 9–18 carbon atoms;

d. sodium and sodium-2-ethyl dodecyl sulfates, sodium decyl sulfate and sodium tridecyl sulfate; and

e. polyvinyl pyrrolidone surfactants.

4,092,171

ORGANOPHOSPHINE CHELATES OF PLATINUM AND PALLADIUM AS SENSITIZERS

John Howard Bigelow, Rochester, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 20, 1976, Ser. No. 659,933
Int. Cl.[2] G03C 1/28
U.S. Cl. 96—108 9 Claims

1. A light-sensitive silver halide photographic element comprising a support coated with at least one silver halide emulsion containing as a chemical sensitizer a chelate of an organophosphine with a platinum or palladium salt, the latter being present in an amount sufficient to sensitize the silver halide emulsion.

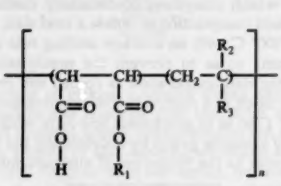
4,092,172

PHOTOCURABLE COMPOSITION COMPRISING A COPOLYMER OF A MALEIC ACID MONOESTER WITH AN α-OLEFINE

Tetsuo Higuchi, Hiratsuka, Japan, assignor to Kansai Paint Co., Ltd., Japan

Filed Jan. 2, 1976, Ser. No. 646,012
Claims priority, application Japan, Aug. 22, 1975, 50-101817; Nov. 22, 1975, 50-140430
Int. Cl.[2] G03C 1/68
U.S. Cl. 96—115 P 11 Claims

1. A photocurable composition which comprises (A) a mixture of 20 to 90% by weight of a maleic acid monoester/αolefine copolymer of the formula:



wherein R_1 is an alkyl group having 1 to 8 carbon atoms, aralkyl group, cyclo group and cycloalkyl group, R_2 is a hydrogen or alkyl group of 1 to 3 carbon atoms, R_3 is a hydrogen or alkyl group of 1 to 6 carbon atoms and n is an integer which provides a number average molecular weight of 55,000 to 200,000 and 10 to 80% by weight of a vinylurethane compound obtained by urethanation reaction of a polyisocyanate compound with a photopolymerizable ethylenically unsaturated alcohol having a number average molecular weight of less than 3,000 or by urethanation reaction of 1 mole of diisocyanate compound with about 1 mole of said photopolymerizable ethylenically unsaturated alcohol and about 1/m mole of m-valent alcohol (wherein m is an integer of 2 to 6) having a number average molecular weight of less than 3,000, and (B) a photosensitizer.

4,092,173

PHOTOGRAPHIC ELEMENTS COATED WITH PROTECTIVE OVERCOATS

Carl Peter Novak; Edward Dixon Morrison, and Gerald Martin Leszyk, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 1, 1976, Ser. No. 737,445
Int. Cl.[2] G03C 1/00
U.S. Cl. 96—119 R 40 Claims

1. A photographic element comprising
(1) a support,
(2) at least one image-bearing layer, and
(3) a protective overcoat layer which is permanently bonded to at least one side of said element; said protective overcoat layer having been formed by (a) coating said element with a radiation-curable coating composition which forms a transparent, flexible, scratch-resistant, crosslinked polymeric layer upon radiation curing, said coating composition comprising (1) an acrylated urethane, (2) an aliphatic ethylenically-unsaturated carboxylic acid, and (3) a multifunctional acrylate, and (b) subjecting said coating to radiation sufficient to cure said coating and bond it to said element.

18. A method of protecting a photographic element against abrasion and scratches which comprises (a) coating at least one side of said element with a radiation-curable coating composition comprising (1) an acrylated urethane, (2) an aliphatic ethylenically-unsaturated carboxylic acid, and (3) a multifunctional acrylate and (b) subjecting said coating to radiation sufficient to cure said coating and bond it to said element.

25. A radiation-curable coating composition which is useful for the formation of protective overcoats on photographic elements, said composition comprising (1) an acrylated urethane, (2) an aliphatic ethylenically-unsaturated carboxylic acid and (3) a multifunctional acrylate.

4,092,174

PHOTOCHROMIC GLASSES

Edric Ellis, Ormskirk; Richard Gelder, Preston, and Allan Hale, Upholland, Nr. Wigan, all of England, assignors to Pilkington Brothers Limited, St. Helens, England

Continuation-in-part of Ser. No. 764,313, Jan. 31, 1977, abandoned. This application Sep. 21, 1977, Ser. No. 836,116
Claims priority, application United Kingdom, Jan. 30, 1976, 3814/76; Apr. 8, 1976, 14415/76
Int. Cl.[2] C03C 3/26, 3/08, 3/10
U.S. Cl. 106—53 11 Claims

1. A photochromic alumino-phosphate glass having silver halide crystals dispersed throughout the glass, the glass consisting essentially of, in weight percentages,: SiO_2: 8.5 to 25%, Al_2O_3: 13 to 36.5%, P_2O_5: 7.5 to 33.5%, B_2O_3: 7 to 28%, R_2O: 7 to 20.5%, R'O: 0 to 21%, TiO_2: 0 to 6%, ZrO_2: 0 to 10%, PbO: 0 to 8%, where R_2O represents at least one of Na_2O, K_2O and Li_2O, the maximum content of Li_2O being 5%, and R'O represents at least one of MgO, CaO, SrO and BaO, within the following individual limits: MgO: 0 to 4%, CaO: 0 to 6.5%, SrO: 0 to 10%, BaO: 0 to 21%, the amount of SiO_2 is not less than 16% when the B_2O_3 content is less than 8%; and the silver content of the glass, expressed as Ag_2O, is not less than 0.05% by weight.

4,092,175

METHOD OF REMOVING PAPER ADHERED TO A SURFACE

James W. Martin, Somerset, N.J., assignor to William Zinnsser & Co., Inc., Somerset, N.J.

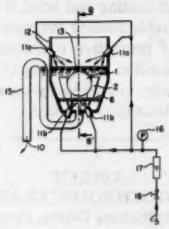
Division of Ser. No. 609,332, Sep. 2, 1975, Pat. No. 4,067,773. This application Jul. 18, 1977, Ser. No. 816,266
Int. Cl.[2] B08B 7/00; C07G 7/02
U.S. Cl. 134—42 8 Claims

1. The method of removing paper adhered to a surface with a starch-based adhesive which comprises admixing (1) an enzyme composition consisting essentially of a mixture of a carbohydrase and a protease, (2) a liquid composition comprising (a) a calcium salt as an activator for said enzyme composition, (b) a surfactant as a wetting agent and (c) a solvent for reducing the rate of evaporation of water from paper, said solvent being selected from the group consisting of diethylene glycol monomethyl ether, dipropylene glycol monomethyl ether and mixtures thereof, said solvent and wetting agent being essentially inert to said enzyme composition and (3) warm water at a temperature from 100° F. to 160° F. in a proportion of between about 0.1 and 1 ounces of the enzyme composition per gallon of water and between about 0.01 and 0.1 ounces of the enzyme composition per fluid ounce of the liquid composition, applying the resultant aqueous composition to the paper, and physically removing the wet paper after the enzyme has degraded the adhesive properties of the adhesive.

4,092,176
APPARATUS FOR WASHING SEMICONDUCTOR WAFERS

Teruo Kozai; Shigeharu Ohara; Hiroshi Suzuki, and Shingo Yanagihara, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 7, 1976, Ser. No. 748,160
Claims priority, application Japan, Dec. 11, 1975, 50-147965
Int. Cl.² B08B 3/02
U.S. Cl. 134—186 5 Claims

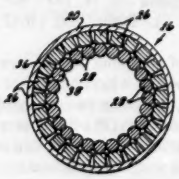


1. A washing apparatus comprising a tub in which a basket setting wafers to be washed is placed, a plurality of nozzles provided above and below the semiconductor wafers for squirting pure water to the semi-conductor wafers and for retaining loosely the semiconductor wafers in said basket by the squirted pure water continuously during a washing operation, a vent provided below the semi-conductor wafers, means for storing the water squirted from said nozzles in said tub to submerge the semiconductor wafers therein, and means for periodically draining the stored water from said tub through said vent when the surface of the stored water reaches a level above the semiconductor wafers.

4,092,177
THERMOPILE CONSTRUCTION

William A. Ray, 4241 Forman Ave., North Hollywood, Calif. 91602

Filed Aug. 18, 1976, Ser. No. 715,425
Int. Cl.² H01L 35/04
U.S. Cl. 136—220 13 Claims

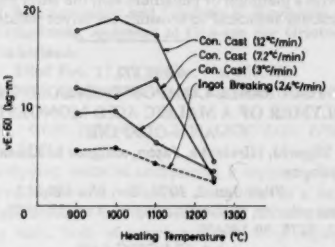


1. A thermopile having a plurality of elongated dissimilar elements, adjacent dissimilar elements being joined together at opposite ends to provide thermocouple junctions, the said dissimilar elements being arrayed generally in a circle around a central axis, a cylindrical sleeve enclosing the elements, the dissimilar elements including one group arrayed adjacent to the inside surface of the sleeve and a second group having the elements positioned radially inward from the first group, individual elements of the second group being positioned radially inward of adjacent individual elements of the first group.

4,092,178
PROCESS FOR PRODUCING A STEEL HAVING EXCELLENT STRENGTH AND TOUGHNESS

Yasumitsu Onoe; Yoshikazu Matsumura; Hiroshi Katoh; Koe Nakajima, and Shozo Sekino, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 5, 1975, Ser. No. 638,095
Claims priority, application Japan, Dec. 11, 1974, 49-141486
Int. Cl.² C21D 9/48
U.S. Cl. 148—2 2 Claims



1. A process for producing a low alloy steel of fine grain structure containing 0.01–0.10% Al and 0.002–0.009% N and having excellent strength and toughness by a continuous casting process, which comprises continuously casting a molten steel having said composition to obtain a steel slab, cooling said steel slab to 500° C with an average cooling rate of not lower than 3° C/min., so as to prevent the precipitation of AlN, maintaining the slab temperature as cooled and reheating said slab for hot rolling to a relatively low temperature range from 900° to 1150° C so as to precipitate fine AlN while preventing the growth of austenite grains by accelerating the formation of AlN nuclei prior to the formation of austenite nuclei.

4,092,179
METHOD OF PRODUCING HIGH STRENGTH COLD ROLLED STEEL SHEET

Philippe L. Charpentier, Pittsburgh; Robert H. Goodenow, Bethel Park, and William E. Dennis, Pittsburgh, all of Pa., assignors to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed Dec. 27, 1976, Ser. No. 755,364
Int. Cl.² C21D 7/10, 7/14, 9/46
U.S. Cl. 148—2 8 Claims

1. A method for producing a high strength, cold rolled sheet steel product having a surface quality equivalent to that of Drawing Quality Rimmed Steel, comprising:

a. teeming molten steel having a carbon content of about 0.07% to 0.11% and a manganese content of 0.6% manganese maximum into a mold and permitting said molten steel to rim in said mold for a sufficient time to cause said molten steel to solidify as a solid zone on the mold surfaces;

b. adding a sufficient amount of aluminum to molten steel contained in the core of said mold to kill the molten steel core and to ensure substantial freedom from nitrogen aging and adding sufficient columbium to said core to result in a columbium content of about 0.08% to 0.12% in the core;

c. permitting said molten steel core to solidify and form an ingot;

d. hot rolling said ingot into a flat product at a finishing temperature above its Ar_3 temperature and coiling said product at a temperature of from about 1000° F. to 1200° F.;

e. cold rolling the coiled product in an amount of from about 50% to 90% reduction in thickness;

f. batch annealing the coiled product to obtain full recrystallization by maintaining said coil at a minimum temperature

of about 1175° F. for a minimum of about 5 hours and not permitting any portion of the coil to exceed a maximum temperature of 1275° F.; and

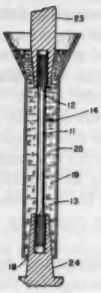
g. temper rolling said coil from about 0.75% to 2.0% temper elongation thereby obtaining a yeild strength of 50,000 p.s.i. minimum.

4,092,180

MANUFACTURE OF TORSION BARS

Edward G. Markow, Oakdale, and Benjamin J. Aleck, Jackson Heights, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed May 3, 1977, Ser. No. 793,480
Int. Cl.[2] C21D *9/02*
U.S. Cl. 148—12 E 19 Claims



1. The method of making a torsion spring having a central working position and terminal grip end from an austensitic stainless steel material whose characteristics are known;

fabricating a blank of said material according to the desired final overall dimensions of said spring, including an allowance for density changes which are predictable from said characteristics;

shaping the terminal grip end on said blanks;

exposing said blank to a temperature at which martensitic transformation takes place,

torsion working said blank at said temperature to apply thereto a stress greater than the yield stress of said material; and

keeping said blank at substantially the same fabricated dimensions;

whereby the resulting torsion spring has high flexibility and high strength.

4,092,181

METHOD OF IMPARTING A FINE GRAIN STRUCTURE TO ALUMINUM ALLOYS HAVING PRECIPITATING CONSTITUENTS

Neil E. Paton, and C. Howard Hamilton, both of Thousand Oaks, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 25, 1977, Ser. No. 790,207
Int. Cl.[2] C22F *1/04*
U.S. Cl. 148—12.7 A 13 Claims

1. A method of imparting a fine grain structure to an aluminum alloy having a precipitating constituent, comprising:

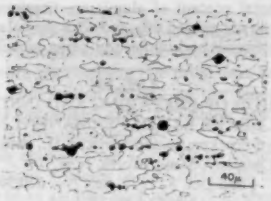
providing an aluminum alloy having a precipitating constituent;

heating said alloy to a solid solution temperature to dissolve at least some of said precipitating constituent in said alloy;

cooling said alloy to a temperature below said solution temperature;

heating said alloy to an overaging temperature above the precipitation hardening temperature for said alloy but below said solution treating temperature to overage said alloy;

plastically deforming said alloy at a temperature equal to or below said overaging temperature a sufficient amount to provide lattice strain for recrystallization; and



heating said alloy to a recrystallization temperature, whereby precipitates formed during said step of heating to overage said alloy form nuclei for the recrystallization and controlled growth of a fine grain structure.

4,092,182

SOLDERING FLUX COMPOSITION

Gordon Francis Arbib, and Wallace Rubin, both of Hemel Hempstead, England, assignors to Multicore Solders Limited, England

Filed May 10, 1977, Ser. No. 795,635
Claims priority, application United Kingdom, Jun. 11, 1976, 24410/76
Int. Cl.[2] B23K *35/34*
U.S. Cl. 148—23 13 Claims

1. A flux composition, comprising, as essential constituents:

(1) at least one ester derived from a polyhydric alcohol and at least one saturated or unsaturated fatty acid or mononuclear aromatic acid; and

(2) at least one additional constituent selected from:

(a) organic acids which are substantially soluble in said ester of a polyhydric alcohol when in a molten condition;

(b) flux activating agents; and

(c) flux residue hardening agents,

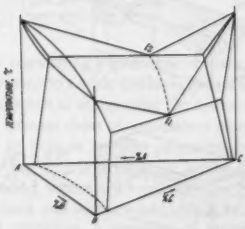
said ester being present in an amount of at least 25% by weight based on the total weight of constituents (1) and (2).

4,092,183

DIRECTIONALLY SOLIDIFIED CASTINGS

Eric Grundy, Great Haywood, England, assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Nov. 22, 1976, Ser. No. 743,650
Claims priority, application United Kingdom, Nov. 28, 1975, 49032/75
Int. Cl.[2] C22C *19/05*
U.S. Cl. 148—32 10 Claims



1. A directionally solidified casting comprising a basically monovariant nickel-chromium-molybdenum eutectic alloy composition segregated into a matrix phase within which is dispersed a fibrous phase comprising a plurality of substantially

aligned lamellae, said alloy composition consisting essentially of 20% to 40% chromium, 15% to 30% molybdenum, up to 30% cobalt, up to 0.05% carbon, up to 5% aluminum, up to 5% titanium, up to 5% niobium and up to 5% tantalum, provided the total content of aluminum, titanium, niobium and tantalum does not exceed 6%, and with the balance, except for incidental elements and impurities, being nickel.

4,092,184

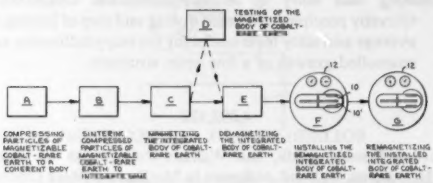
METHOD OF PREPARING AND INSTALLING COBALT-RARE EARTH PERMANENT MAGNETS

Harold Lloyd Stucker, Somersworth, N.H., assignor to General Electric Company, Somersworth, N.H.

Filed Oct. 8, 1975, Ser. No. 620,796

Int. Cl.² H01F *1/02*

U.S. Cl. 148—103 **9 Claims**


D
TESTING OF THE MAGNETIZED BODY OF COBALT-RARE EARTH
A
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COMPRESSING PARTICLES OF MAGNETIZABLE COBALT-RARE EARTH TO A COHERENT BODY
SINTERING COMPRESSED PARTICLES OF MAGNETIZABLE COBALT-RARE EARTH TO INTEGRATE SAME
MAGNETIZING THE INTEGRATED BODY OF COBALT-RARE EARTH
DEMAGNETIZING THE INTEGRATED BODY OF COBALT-RARE EARTH
INSTALLING THE DEMAGNETIZED INTEGRATED BODY OF COBALT-RARE EARTH
REMAGNETIZING THE INSTALLED INTEGRATED BODY OF COBALT-RARE EARTH

1. A method for preparing a cobalt-rare earth permanent magnet and installing same in an electromagnetic device, comprising the steps of:

(a) magnetizing an integrated body of compressed and sintered cobalt-rare earth particles in a magnetizing field of a predetermined direction of polarity and of at least approximately 60 kilo-oersteds to substantially completely magnetically saturate the cobalt-rare earth body;

(b) demagnetizing the substantially saturated body of cobalt-rare earth;

(c) installing the demagnetized body of cobalt-rare earth in an electromagnetic device; and

(d) remagnetizing the installed body of cobalt-rare earth in a magnetizing field of the same predetermined direction of polarity and of a strength of not more than approximately one half as that of the previous magnetization to substantially complete magnetic saturation.

4,092,185

METHOD OF MANUFACTURING SILICON INTEGRATED CIRCUITS UTILIZING SELECTIVELY DOPED OXIDES

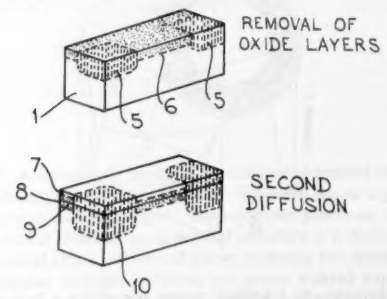
John Wilfred Richer, Wilmslow, England, assignor to International Computers Limited, London, England

Filed July 19, 1976, Ser. No. 706,459

Claims priority, application United Kingdom, Jul. 26, 1975, 31358/75

Int. Cl.² H01L *21/76, 21/20, 21/225*

U.S. Cl. 148—175 **3 Claims**



1. A method of forming a buried and isolated layer in an integrated circuit including the steps of,

(a) forming a substrate of semiconductive material having a first conductivity characteristic,

(b) applying to the substrate a first layer of a semiconductive oxide layer containing a first additive having second conductivity characteristics different from that of the substrate and a first rate of diffusion with respect to the material of the substrate,

(c) forming a pattern of openings in the first layer;

(d) applying a second layer of a semiconductive oxide containing a second additive having a conductivity characteristic of the same polarity as that of the substrate and also a rate of diffusion with respect to the material of the substrate which is faster than the rate of diffusion of the first additive material, said second additive material also being such that the oxide of the first layer acts as a diffusion barrier thereto;

(e) simultaneously causing the first and second additives to diffuse into the substrate;

(f) arresting the diffusion operation when the slower diffusing additive materials have penetrated to the required extent in the substrate;

(g) removing said layers from the substrate;

(h) operating upon the now exposed surface of the substrate to render it suitable for epitaxial growth;

(i) epitaxially growing an extension layer to the substrate, said extension layer having a conductivity as desired, so as to bury the regions containing the diffused in additives, and;

(j) subjecting the substrate to a second diffusion operation for a period long enough for the faster diffusing additive to reach the other outer surface of the epitaxial layer.

4,092,186

COMBUSTION INHIBITED ROCKET PROPELLANTS

Stuart Gordon, Cleobury Mortimer, and Geoffrey Ian Evans, Bewdley, both of England, assignors to Imperial Metal Industries (Kynoch) Limited, Warwickshire, England

Continuation of Ser. No. 381,487, Jul. 23, 1973, abandoned, which is a continuation of Ser. No. 137,949, Apr. 27, 1971, abandoned. This application Jun. 1, 1977, Ser. No. 802,531

Claims priority, application United Kingdom, May 6, 1970, 21857/70

Int. Cl.² C06B *45/28*

U.S. Cl. 149—10 **8 Claims**

1. A solid propellant charge for a rocket motor comprising a solid fuel smokeless propellant, and combustion inhibition material, the combustion inhibition material being bonded directly to the surfaces of the propellant of which combustion is to be inhibited, and the combustion inhibition material being of elastomeric material containing a compatible particulate filler material which constitutes at least 50wt% of the combustion inhibition material, the filler material contributing to a lower thermal conductivity than that of the elastomeric material alone and comprising at least one of the group consisting of oxides, hydroxides, carbonates and sulphates of at least one element selected from:

(a) beryllium, magnesium, calcium, zinc, strontium, cadmium and barium;

(b) aluminium;

(c) titanium;

(d) arsenic, antimony and bismuth; and

(e) iron, cobalt and nickel,

the filler material and the sizes of the particles thereof in the combustion inhibition material being such that combustion of the combustion inhibition material results in a product wholly gaseous or containing particles which are of a size less than 1 micron or greater than 15 microns.

4,092,187

PROCESS FOR COATING CRYSTALLINE HIGH EXPLOSIVES

Floyd J. Hildebrant, Andover, and Bernard R. Banker, Mine Hill, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 18, 1976, Ser. No. 715,279
Int. Cl.[2] C06B 45/22
U.S. Cl. 149—11 5 Claims

1. A process for producing an improved desensitizing coating on a particulate, crystalline, organic high explosive, which comprises:

a. mixing the particulate explosive with an aqueous dispersion of a normally solid water-insoluble wax containing at least one free carboxylic acid group in the molecule which can react with a polyvalent metal salt, obtained with a dispersing agent consisting essentially of a water-soluble salt of a fatty acid containing at least 10 carbon atoms;

b. incorporating in the resulting mixture a precipitating agent consisting essentially of a water-soluble polyvalent metal salt, which precipitates the water-insoluble polyvalent metal salt of the fatty acid, and breaks the dispersion, whereby the explosive particles are covered with a coating consisting essentially of an intimate composite of the wax and the insoluble polyvalent salt of said acid;

c. separating the coated explosive particles from the aqueous medium; and

d. drying the coated explosive particles;

and wherein the amount of said coating ranges from 1 to 20% by weight of the particulate explosive.

4,092,188

NITRAMINE PROPELLANTS

Alan M. Lovelace, Acting Administrator of the National Aeronautics and Space Administration, with respect to an invention of Norman S. Cohen, Redlands, and Leon D. Strand, both of Pasadena, Calif.

Filed May 16, 1977, Ser. No. 797,210
Int. Cl.[2] C06B 45/10
U.S. Cl. 149—19.4 14 Claims

1. A gun propellant composition absent an exponent shift in the burning rate curve consisting essentially of a dispersion of energetic nitramine particles in

a plasticized binder having a monopropellant burning rate at selected pressure within ±10% of the monopropellant burning rate of the nitramine.

4,092,189

HIGH RATE PROPELLANT

Robert E. Betts, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 1, 1977, Ser. No. 821,019
Int. Cl.[2] C06B 45/10
U.S. Cl. 149—19.2 2 Claims

1. The method of preparing a high burning rate solid propellant grain that is comprised of a multimodal blend of at least one ultra-high burning rate propellant that has been cured and ground to a predetermined particle size and at least one uncured propellant composition that has high tensile strength and compatibility with the ultra-high burning rate propellant and that serves as a binder for the solid propellant grain when cured, said method comprising:

(i) preparing an ultra-high burning rate propellant that burns in excess of 15 inches per second, said ultra-high burning rate propellant comprised of aluminum metal fuel, ultrafine ammonium perchlorate oxidizer, a hydroxy-terminated polybutadiene polymer binder, a carborane burning rate modifier, a plasticizer, a crosslinking agent, and a diisocyanate curing agent;

(ii) curing said ultra-high burning rate propellant in thin sheets to facilitate grinding to a predetermined particle size of granules;

(iii) grinding said ultra-high burning rate propellant to a predetermined particle size of granules from about 0.1 mm to about 5 mm;

(iv) preparing an uncured propellant composition that has a high tensile strength when cured but a lower burning rate than said ultra-high burning rate propellant, said uncured propellant composition serving as the binder for said multimodal propellant grain containing said ultra-high burning rate propellant granules;

(v) adding an amount from about 80 to about 96 weight percent of said granules of said ultra-high burning rate propellant to an amount from about 20 to about 4 weight percent of said uncured propellant composition to form a multimodal blend containing said amount of said granules and said amount of said uncured binder propellant; and,

(vi) curing said multimodal blend to yield a high burning rate solid propellant grain having a controlled burning rate and controlled physical properties achieved by the cured multimodal blend of said cured granules held in dispersed arrangement by said binder propellant.

4,092,190

HOT NITROGEN GENERATOR CONTAINING CALCIUM OXIDE

Joseph E. Flanagan, Woodland Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 737,647, Nov. 1, 1976, abandoned. This application Aug. 10, 1977, Ser. No. 823,380
Int. Cl.[2] C06B 35/00
U.S. Cl. 149—35 5 Claims

1. A solid propellant hot nitrogen gas generator system comprising:

calcium oxide as a heat absorbent

calcium azide as the primary nitrogen source

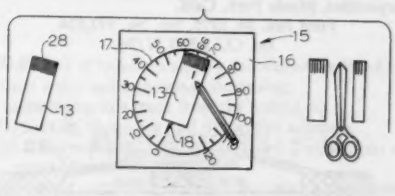
calcium nitrate as an oxidizing source for all the calcium present in the nitrogen source.

4,092,191

SPEEDOMETER SCALE CONVERSION KIT AND METHOD

Thomas L. Jones, 617-B Hibbard Dr., Chapel Hill, N.C. 27514

Filed Sep. 28, 1977, Ser. No. 837,463
Int. Cl.[2] G01P 1/08
U.S. Cl. 156—64 4 Claims



4. A method for converting a speedometer scale calibrated in terms of miles per hour to a scale calibrated in terms of kilometers per hour, said method comprising the following steps:

(a) providing a laminar sheet of transparent mateiral with an adhesive on its bottom surface protected by a backing sheet and having indicia printed on its top surface, with said indicia being separately removable by peeling from the backing sheet, and wherein said indicia includes a scale of graduated markings, a plurality of heavily darkened stripes and a progression of numbers ranging between 10 and 190 with the difference between each number in the progession being 20;

(b) removing said scale of graduated markings from said laminar sheet and causing it to adhere across the width of

a cardboard strip at one end thereof to provide a measuring gauge;

(c) measuring the distance between 60 and 66 miles per hour on the speedometer to be converted with said gauge and cutting the cardboard strip to a width corresponding to this distance so as to obtain a gauge whose width represents 10 kilometers per hour;

(d) placing the left edge of the gauge on the 0 mile per hour mark of said speedometer and thereafter placing the numeral 10, after removal from said laminar sheet, onto the speedometer at a position corresponding to the right edge of said gauge;

(e) moving the left edge of said gauge to a position corresponding to the position of said numeral **10** and thereafter placing a stripe, after removal from said laminar sheet, onto the speedometer at a position corresponding to the right edge of said gauge; and

(f) repeating the sequence of (d) and (e) above to position the remaining numerals from 30 to 190 in progression onto the said speedometer with each numeral being followed by the positioning of a stripe.

4,092,192

HIGH TEMPERATURE CAULKING COMPOSITION AND METHOD

Douglas Magyari, 526 Charlotte, Royal Oak, Mich. 48073

Filed Mar. 10, 1977, Ser. No. 776,217

Int. Cl.² B32B *35/00*

U.S. Cl. 156—69 **13 Claims**

11. A method of sealing high temperature metal oven closures, particularly coke oven doors, lids and caps and the like, comprising the steps of:

forming a semi-fluid putty-like composition which is adhesive to hot metal surfaces up to about 1200° F, having by weight 19 to 23% of a high temperature fluid silicone oil, 20 to 34% of a thermally conductive white metal oxide, 20 to 34% of an inert particulate filler material and 22 to 35% of a hydrated alkaline metal hydroxide,

sealing the metal oven closures by applying said putty-like composition to the hot metal surfaces surrounding said closures following charging of the oven, and

resealing the oven closures following recharging the oven directly over the same metal surfaces without cleaning.

4,092,193

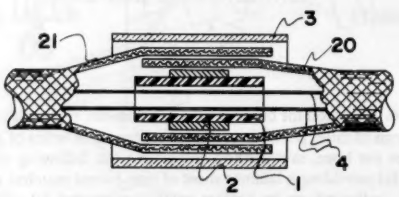
METHOD FOR JOINING SUBSTRATES UTILIZING COUPLING MEANS

Philip Lee Brooks, Menlo Park, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Jun. 30, 1975, Ser. No. 592,024

Int. Cl.² B32B *31/26*

U.S. Cl. 156—83 **20 Claims**



1. A method for joining at least two substrates comprising (a) positioning said substrates such that at least a portion of the surface area of each of said substrates is in an overlapping relationship with at least a portion of the surface area of at least one other of said substrates (b) positioning said overlapping portion of said substrates between two members of a coupling means said coupling means comprising an inner member having disposed on the outer surface thereof a fusible agent and an outer member in an exteriorly concentric spaced relationship with said inner member, said inner and outer members defining the area within which at least part of the overlapping portion of said substrates are positioned; (c) heating the assembly of substrates and said coupling means to an extent sufficient to cause the fusible agent on said inner member to flow toward said outer member and wet at least a portion of the overlapping surfaces of the substrates (d) causing said fusible agent to solidify thereby bonding said substrates to each other.

4,092,194

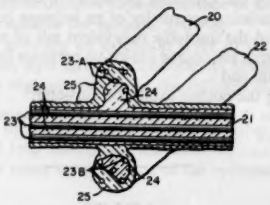
PROCESS FOR MAKING CERAMIC REFRACTORY OXIDE FIBER-REINFORCED CERAMIC TUBE

James R. Green, Laurel, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 566,319, Apr. 9, 1975, Pat. No. 3,986,528, which is a continuation-in-part of Ser. No. 290,643, Sep. 20, 1972, abandoned. This application Jul. 30, 1976, Ser. No. 710,101

Int. Cl.² B01J *35/00*; F16L *9/00*

U.S. Cl. 156—89 **6 Claims**



1. A process for the preparation of a fiber-reinforced ceramic tube with fluid permeable walls comprising the steps of

A. plying separate yarns of

1. a refractory oxide fiber having a softening point above about 750° C. or a fiber of a precursor of the refractory oxide and

2. a ceramic binder fiber having a softening point above about 750° C. but at least 50° C. lower than the yarn sag temperature of refractory oxide fiber

B. winding the plied yarn on a tubular core in multiple layers of spaced helical coils in a criss-cross fashion to form a tube of yarn having a multitude of channels of quadrilateral-shaped cross-sections extending through the walls of the tube of yarn,

C. firing the tube of yarn for a time and temperature sufficient to

1. convert any precursor fibers present to refractory oxide fibers and

2. soften the ceramic binder fiber to such an extent that it at least partially flows around the refractory oxide fibers to bind adjacent fibers upon cooling, and

D. placing a coating composition on the bonded structure and firing to form a refractory oxide matrix at least partially surrounding said fibers but not closing said channels and to provide said tube with a compressive strength of at least 30 psi.

4,092,195

REPAIR OF POLYSTYRENE REFRIGERATOR LINERS

Gloria Belle Alwood, 7597 El Terraza Dr., Sacramento, Calif. 95828, and George Dimitriadis, 610 Wade Ave., Modesto, Calif. 95351

Filed Apr. 14, 1977, Ser. No. 787,706

Int. Cl.² B32B *35/00*

U.S. Cl. 156—94 **7 Claims**

1. In a method for repairing a fractured liner in a refrigeration unit comprising:

(a) providing a mixture of methyl ethyl ketone and polystyrene blended so as to form a liquid of sufficient viscosity to permit the coating of said liner without streaking;
(b) applying one coating of said mixture to the fractured area of the liner;
(c) allowing the coated area to dry;
(d) sanding the coating;
(e) applying a second coating of the said mixture over the first coating;
(f) placing a pre-cut patch of fiberglass surface matting over the coated area while the second coating is still wet;
(g) allowing the patched area to dry;
(h) sand the patched area to a smooth surface;
(i) apply a third coating of said mixture to the patched area; and
(j) allow the patched area to dry.

4,092,196

RETREADING AND REBUILDING OF RADIAL TIRES

Rickie L. Miller, Suffield, and Noel E. Walters, Tallmadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 22, 1976, Ser. No. 668,891
Int. Cl.² B29H *17/14, 17/37*
U.S. Cl. 156—96 **10 Claims**

1. A method of retreading a radial tire having damaged belt plies comprising:
(a) removing the worn tread of the tire;
(b) removing the damaged belt plies of the belt structure interposed between the carcass plies and tread of the tire;
(c) at least replacing the removed belt plies with like belt plies to form a renewed belt structure;
(d) winding a narrow, inextensible band centrally around the outer periphery of the tire, when the worn tread and damaged belt plies are removed, the band being separate from the belt plies and wide enough to restrict expansion of the tire beyond a desired diameter correlated to the diameter of the tire when newly molded, vulcanized, and inflated, and narrow enough not to radically change the operational characteristics of the renewed belt structure;
(e) replacing the worn tread with a new tread; and
(f) bonding the new tread and belt plies to the tire.

4,092,197

METHOD OF SECURING A THERMOPLASTIC COVERING TO A GROOVED BLOCK

Edward S. Robbins, P.O. Box 2386, Muscle Shoals, Ala. 35660

Division of Ser. No. 329,200, Feb. 2, 1973, abandoned. This application Sep. 17, 1975, Ser. No. 614,158
Int. Cl.² B29C *17/04;* B32B *31/30*
U.S. Cl. 156—212 **2 Claims**

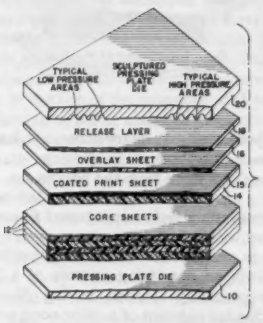
1. A method of continuously securing a covering of thermoplastic sheet material to a surface of individual masonry blocks each of which has a plurality of surfaces and a groove formed in the surfaces extending from the surface to be covered, said groove being formed about the exterior of said block, comprising the steps of:
a. providing a series of receptacles carried on conveyor means, each receptacle having an opening and dimensions such that a space is provided between the walls of each said receptacle and the surfaces of a block,
b. disposing a said block in a said receptacle with the surface to be covered and said groove of each block projecting out of said opening in the receptacle at a first station,
c. continuously moving the receptacles carrying said blocks beneath means for supplying a heated thermoplastic sheet material at a second station,
d. continuously draping said heated thermoplastic sheet material over a said block and opening of a said receptacle as said block and receptacle move through said second station,
e. drawing a vacuum on the interior of a said receptacle at a third station which is downstream of said second station whereby portions of said heated sheet material will be pulled into contact with a said groove of a said block at said third station,
f. subsequently, severing excess sheet material at a fourth station, and
g. then removing each block from its associated receptacle at a fifth station.

4,092,198

PROCESS FOR HIGH PRESSURE DECORATIVE LAMINATE HAVING REGISTERED COLOR AND EMBOSSING AND RESULTANT PRODUCT

Herbert I. Scher; Israel S. Ungar, both of Randallstown, and Joseph A. Lex, Glen Burnie, all of Md., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Nov. 5, 1975, Ser. No. 629,123
Int. Cl.² B32B *31/20*
U.S. Cl. 156—222 **6 Claims**



1. A method of forming a unitary decorative laminate having registered color and embossing comprising:
A. assemblying in a stack from the bottom up
(1) backing means for said decorative laminate,
(2) a thermosetting resin impregnated fibrous print sheet provided with a first color,
(3) a dried opacifying coating comprising a thermosetting resin having dispersed therein finely divided pigment of a color contrasting with said first color,
(4) a fibrous overlay sheet impregnated with a thermosetting resin, and
(5) a sculptured pressing plate die having a surface with high areas and low areas capable of being impressed into the uppermost of said fibrous sheets, and means to prevent said sculptured pressing plate die from sticking to said overlay sheet during lamination;
B. applying to the upper and lower surfaces of said assembly sufficient heat and pressure to cure said resins to product said unitary embossed decorative high pressure laminate by
(1) effecting a lamination of said fibrous sheets together with each other and with said backing means,

(2) imparting the sculptured surface of said die to the uppermost of said fibrous sheets and

(3) effecting lateral flow of said opacifying setting resin and pigment coating from the debossed portions beneath the surface of said laminate to the embossed portions of said laminate so that said first color is visible in said debossed portions and said contrasting color of said finely divided pigment is visible in said embossed portions; and

C. stripping said sculptured die from the resultant laminated assembly so as to provide said laminate having areas of registered color and embossing.

4,092,199

HIGH PRESSURE DECORATIVE LAMINATE HAVING REGISTERED COLOR AND EMBOSSING

Israel S. Ungar; Herbert I. Scher, both of Randallstown, and Delbert A. Williams, Baltimore, all of Md., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Dec. 2, 1974, Ser. No. 528,776

Int. Cl.² B32B *31/20*

U.S. Cl. 156—222 **7 Claims**

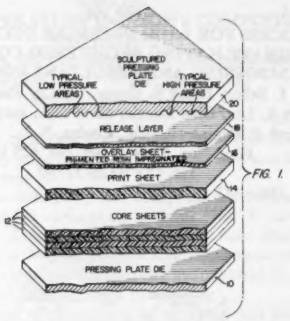


FIG. 1.

1. A method of forming a unitary decorative laminate having registered color and embossing comprising:

A. assembling in a stack from the bottom up

(1) backing means for said decorative laminate,

(2) a thermosetting resin impregnated fibrous print sheet provided with a first color,

(3) a fibrous overlay sheet substantially uniformly impregnated with an opacifying mixture of a thermosetting resin imprenating solution having dispersed therein finely divided pigment of a color contrasting with said first color, said pigment being retained substantially on the fibers of said overlay sheet and

(4) a sculptured pressing plate die having a surface with high areas and low areas capable of being impressed into the uppermost of said fibrous sheets with said high and low areas adjacent said overlay sheet, and means to prevent said sculptured pressing plate die from sticking to said overlay sheet during lamination;

B. applying to the upper and lower surfaces of said assembly sufficient heat and pressure to cure said resins to produce said unitary embossed decorative high pressure laminate by

(1) effecting a lamination of said fibrous sheets together with each other and with said backing means,

(2) imparting the sculptured surface of said die to the uppermost of fibrous sheets and

(3) effecting lateral flow of said opacifying mixture of said thermosetting resin and said pigment on said overlay sheet from the debossed portions of the surface of said laminate to the embossed portions of said laminate so that said first color is visible in said debossed portions and said contrasting color of said finely devided pigment is visible in said embossed portions; and

C. stripping said sculptured die from the resultant laminated assembly so as to provide said laminate having areas of registered color and embossing.

4,092,200

PROCESS FOR MANUFACTURING AN AUTOMOTIVE CEILING PANEL

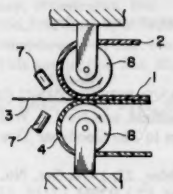
Takao Nomura; Yoshiro Umemoto, both of Nagoya, and Tatsuo Sakamoto, Okazaki, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Sep. 28, 1976, Ser. No. 727,630

Claims priority, application Japan, Oct. 7, 1975, 50-120390

Int. Cl.² B29B *3/00*

U.S. Cl. 156—245 **1 Claim**



1. A process for manufacturing an automotive ceiling panel comprising the steps of passing a first layer of polyethylene foam having a pair of opposed surfaces through a crimp-pattern forming machine to form a crimp-pattern on one of said surfaces, providing a second layer of polyethylene foam, providing a metal lathe, providing a pair of rollers mounted for rotation in opposite directions on generally parallel axes, forming a fusion-bonded laminate of said first polyethylene foam layer, said second polyethylene foam layer, with said metal lathe sandwiched therebetween by heating said first and second polyethylene foam layers and subsequently passing said first and second polyethylene foam layers with said metal lathe therebetween between said pair of rollers, with the surface of said first polyethylene foam layer opposite said one surface thereof being placed in engagement with said metal lathe while passing through said pair of rollers, said laminate thus formed constituting said auto ceiling panel with said one surface of said first polyethylene foam layer having said crimp pattern thereon facing outwardly of said ceiling panel to form a decorative surface thereof, and placing said laminate between a pair of opposed die members and cold pressing said laminate into a desired shape for said ceiling panel between said opposed die members while firmly gripping and holding the periphery of said laminate during said cold pressing operation.

4,092,201

PROCESS AND APPARATUS FOR COATING AN AIR-PERMEABLE CONTAINER WITH A FOIL OF THERMOPLASTIC MATERIAL

Fritz Wommelsdorf, Hamburg, Germany, assignor to Maschinenfabrik Rissen GmbH, Hamburg, Germany

Filed Oct. 26, 1976, Ser. No. 735,775

Claims priority, application Germany, Oct. 23, 1975, 2547477

Int. Cl.² B32B *27/10*; B65D *5/56*

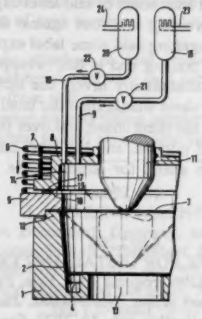
U.S. Cl. 156—285 **8 Claims**

1. A process for coating an air-permeable container with a hot plastic foil of thermoplastic material and coolingly solidifying the foil in place, which comprises the steps of:

directing against the foil a drawing stream of gas at a pressure in excess of the atmospheric pressure external to the container,

said stream of gas being at a pressure sufficient to press the foil in its hot plastic condition into the container until the foil completely fits the container and being at a flow rate and temperature which prevent said foil from solidifying; and

directing against the foil a cooling stream of gas at a pressure in excess of the atmospheric pressure external to the container, said stream of gas being at a pressure sufficient to guarantee the shape of the foil and being at a flow rate and temperature sufficient to cool and solidify the foil.

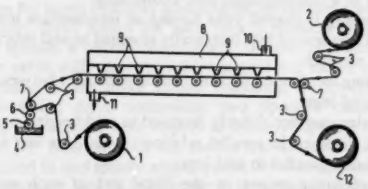


4,092,202

METHOD FOR JOINING FOILS

Berndt Bergk; Klemens Lilienbeck; Gerhard Friedrich Ottmann; Heinrich Stolzenbach; Herbert Wramba, and Walter Wulff, all of Wuppertal, Germany, assignors to Dr. Kurt Herberts & Co. Gesellschaft mit beschrankter Haftung Vorm. Otto Louis Herberts, Wuppertal, Germany

Filed Nov. 3, 1975, Ser. No. 628,384
Claims priority, application Austria, Nov. 4, 1974, 8807/74
Int. Cl.[2] C09J *5/00*
U.S. Cl. 156—331 **11 Claims**



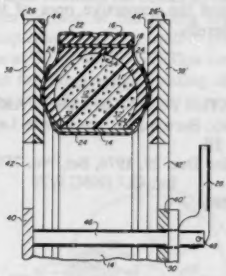
1. In a method for joining foils including the steps of mechanically coating at a high speed at least one of the foil sides to be joined with a reaction product of a hydroxy-functional polyethers or polyesters with polyisocyanates or polyisothiocyanates, said reaction product containing free —NCO or —NCS groups and being reactable with H-acid compounds, and subsequently laminating the foils, the improvement which comprises said reaction product having an average molecular weight of from about 500–10,000 and a —NCO or —NCS group content of from about 1–10% by weight, said reaction product being substantially solvent-free when applied and having a viscosity of at most 60 Pas under application conditions, and adjusting the temperature of the rea¯tion product application conditions to at most 140° C but not less than a temperature which is so far below the temperature of the ambient air that such an amount of air humidity will be condensed in the reaction product to be applied that its pot-life would drop the value required for the implementation of the method.

4,092,203

APPARATUS FOR USE IN TIRE RETREADING

Albert A. Harrelson, Jr., Asheboro, N.C., assignor to Harrelson Rubber Company, Asheboro, N.C.

Filed Mar. 24, 1976, Ser. No. 669,937
Int. Cl.[2] B29H *17/36*
U.S. Cl. 156—394 **5 Claims**



1. Tire retreading apparatus for use in association with a tire assembly including a rim-mounted tire having thereon a replacement tread strip to be permanently bonded to the tire within a heated pressure chamber, comprising:

a first flexible impervious shroud member having a central portion extending in overlying encircling relationship to the tread strip upon the tire, and having opposite marginal edge portions extending in overlying adjacent relationship to respective opposite sidewalls of the tire;

first venting means upon said central portion of said shroud member for venting air entrapped between said shroud member and said tread strip encircled thereby;

a second flexible impervious shroud member having a central portion extending in overlying encircling relationship to the tire-mounting rim and to the juncture thereof with the beads of the tire of the assembly, said second shroud member having opposite marginal edge portions extending in overlying adjacent relationship to respective opposite sidewalls of the tire and in contigious relationship to opposite ones of said marginal edge portions of said first-mentioned shroud member;

first and second disc-like members disposed in laterally spaced and substantially parallel relationship to each other adjacent opposite sidewalls of the tire for movement toward and away from each other, movement of said disc-like members toward each other being opposed only by the presence therebetween of the tire assembly; each of said disc-like members including a radially-outermost annular section, a radially-innermost section, and a plurality of circumferentially-spaced spoke-like sections extending generally radially between and rigidly interconnecting said outermost and innermost sections, the areas between said sections of each of said disc-like members being open; said disc-like members extending in substantially co-axial relationship to each other and to the tire and said radially-outermost sections thereof overlying respective ones of said marginal edge portions of said first and second shroud members and respective ones of the tire sidewalls overlaid by said edge portions of said shroud members;

second venting means upon said central portion of said second shroud member, said second venting means being accessible through said open areas of said disc-like members, for venting air entrapped between said second shroud member and the components of said assembly encircled thereby;

and releasable clamping means extending generally axially through the tire assembly and interconnecting said disc-like members for so forcing said disc-like members toward each other as to create fluid-tight, sealed relationships between said marginal edge portions of said shroud mem-

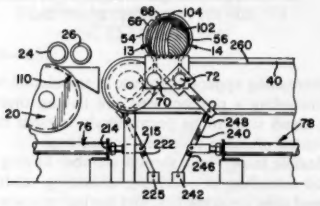
bers and the respective ones of the tire sidewalls overlaid thereby; said sealed relationships being created by laterally-directed compressive forces imposed by said outermost sections of said disc-like members upon respective ones of said marginal edge portions of said shroud members and being effective to prohibit passage, during heating of said assembly within said pressure chamber, of air or other fluid between said marginal edge portions of said shroud members and the respective ones of the tire sidewalls overlaid thereby.

4,092,204

APPARATUS FOR LABELING YARN SKEINS

James G. Wesley, Berwyn, Ill., assignor to Labelette Company, Forest Park, Ill.

Filed Dec. 29, 1976, Ser. No. 755,196
Int. Cl.[2] B65C 9/26
U.S. Cl. 156—481 **3 Claims**



1. Apparatus for applying a label about the shank of a skein of yarn or the like, said apparatus comprising:

a processing way,

said way including a labeling station,

a label supply station,

and means for feeding a label from said label supply station to said labeling station,

said label supply station and said label feeding means being located relative to said way to dispose the label to extend and move longitudinally of said way,

said label supply station including means for applying glue only to the underside of the label trailing end portion,

said labeling station comprising:

a pair of swing arms each mounted for swinging movement about a horizontal axis extending transversely of said way and in planes extending longitudinally of said way,

means for supporting a skein to be labeled above said axes, with the skein disposed tranversely of said way,

means for centering the label supplied to said labeling station across said supporting means and with respect to said axes,

said swing arms being of oppositely arched, semi-loop configuration with their loops lying in their respective swinging planes,

said swing arms being movable between retracted inoperative positions on either side of and below the level of said supporting means ane extended operative positions encompassing a skein to be labeled that is placed on said supporting means for wrapping around the skein shank the label to be applied thereto,

one of said swing arms being on the label infeed side of said labeling station and the other swing arm being on the opposite side of said station longitudinally of said way,

means for sequentially swinging first said one swing arm from said inoperative position to said operative positon thereof and then said other swing arm from said inoperative position to said operative position thereof for bringing the label trailing and leading ends into overlapping relation to define a label overlapping portion extending longitudinally of said swing arm axes,

said swing arms being formed to expose portions of the label overlapped portion lengthwise of said axes,

and means for pressing the overlapped label ends against the shank of the skein for bringing the label ends into firm adherence,

said pressing means comprising a pressure foot formed to engage against at least some of said label exposed portions and means for pressing said foot against the skein shank with said foot engaging said some label exposed portions,

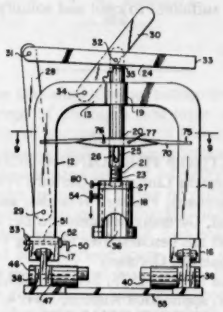
whereby the label trailing end is first wrapped against the skein shank to substantially invert the label trailing end portion over the skein shank, then the label leading end is wrapped against the skein shank and over the glue bearing label trailing end portion, and the label ends are pressed against the skein shank for adhering the label ends together.

4,092,205

MACHINE FOR INSTALLING TEES

William Mieszczak, 4396 Iroquois Ave., Erie, Pa. 16511

Continuation-in-part of Ser. No. 543,032, Jan. 22, 1975, abandoned. This application Feb. 15, 1977, Ser. No. 768,773
Int. Cl.[2] B25B 1/20, 27/00; F16L 47/02
U.S. Cl. 156—499 **9 Claims**



1. A machine for attaching thermoplastic fittings to the sidewall of a thermoplastic pipe comprising:

a generally U-shaped yoke having an intermediate member and two spaced legs intergrally attached to said intermediate member,

a bearing member on said intermediate member between said spaced legs,

a tubular member slidably received in said bearing member and disposed in parallel relation to said legs and axially slidably parallel to said legs,

pipe clamping means on the distal end of each said leg romote from said intermediate member whereby a pipe for receiving a fitting may be supported on said legs in spaced parallel relation to said intermediate member,

said clamping means comprising two first pipe clamp parts and two second pipe clamp parts,

hinge means swingably connecting each said second pipe clamp part to a respective said first pipe clamp part and a clamping member on each said first pipe clamp part for clamping each said second pipe clamp part to a respective said first pipe clamp part with a pipe therebetween,

means rigidly fixing each of said first pipe clamp parts to the distal end of each said leg of said frame,

and means extending generally parallel to said intermediate member of said U-shaped yoke for rigidly supporting said second pipe clamp parts,

a threaded rod telescopically received in said tubular member,

means on said threaded rod for supporting a fitting support to be attached to said pipe,

a longitudinally extending slot in said tubular member,

and a compression spring in said tubular member engaging

said threaded rod and adapted to urge said threaded rod toward a pipe supported in said pipe clamping means,

a pin diametrically extending from at least one side of said threaded rod and received in said slot for limiting the movement of said threaded rod toward and away from said pipe,

handle means attached to said frame and engaging said tubular member for moving said tubular member toward and away from said pipe,

releasable means on said fitting support for holding a fitting to be attached to said pipe in said fitting support.

4,092,206

LABELLING MACHINE

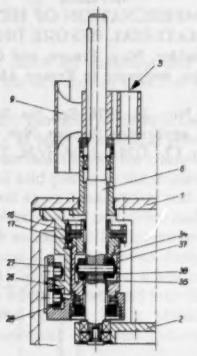
Rudolf Zodrow, Dusseldorf, Germany, assignor to Jagenberg-Werke Aktiengesellschaft, Dusseldorf, Germany

Filed Mar. 18, 1977, Ser. No. 779,104

Claims priority, application Germany, May 3, 1976, 2619067

Int. Cl.² B65C *9/00*

U.S. Cl. 156—568 **5 Claims**



1. A labelling machine comprising a revolving carrier; at least one pickup element with an outwardly curved receiving surface for labels rotatably mounted on the carrier; a stationary sun gear; drive means for each pickup element including a drive spindle, a pinion meshing with the sun gear and axially displaceable with respect to the sun gear and means coupling the pinion to the drive spindle including a cam-controlled compensating drive comprising two opposite cams pieces axially displaceable with respect to the drive spindle and connected for rotation with the pinion and at least one driver connected to said spindle and disposed between the cam pieces for driving the spindle in response to the rotation of the pinion, said cam pieces being settable relative to each other in an axial direction with respect to the spindle to eliminate free play; and cam means for controlling the compensating drive comprising an annular cam, a bipartite cam follower and means mounting the cam follower for axial adjustment relative to said cam to eliminate free play.

4,092,207

BOTTLE LABELING MACHINE

Rudolf Zodrow, Dusseldorf, Germany, assignor to Jagenberg-Werke Aktiengesellschaft, Dusseldorf, Germany

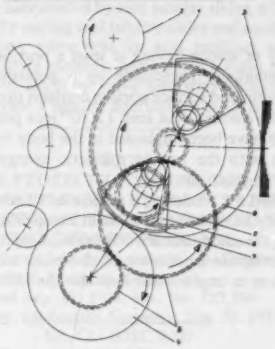
Continuation of Ser. No. 754,869, Dec. 27, 1976, abandoned, which is a continuation of Ser. No. 597,276, Jul. 18, 1975, abandoned. This application May 16, 1977, Ser. No. 797,157

Claims priority, application Germany, Jul. 14, 1974, 2435568

Int. Cl.² B65C *9/16*

U.S. Cl. 156—568 **1 Claim**

1. In a labeling machine such as a bottle labeling machine having a circular rotatable support, means for rotating said support, a gluing station, a label magazine station and a rotating gripper cylinder station disposed about said support, the improvement comprising a plurality of gluing segments carried by said support for rotation therewith and for rotation about their own axes, each segment having a pickup-transfer surface for successively contacting said gluing, magazine and gripper cylinder stations, said pickup-transfer surface comprising a segment of the surface of a cylinder and having a constant radius of curvature and the axis of rotation of said gluing segment being located between the center of curvature of said cylindrical transfer surface of the gluing segment and the center of the pickup-transfer surface itself to present a uniform geometric surface at every contact position for a given speed of rotation, means for effecting the rotating of said segments about their own axes to effect at least one complete revolution



thereof during one revolution of the support, and means operatively connecting said support, said gripper cylinder and said segments to effect rotation of said support and gripper cylinder in the same direction with each segment rotating in the opposite direction, wherein the means operatively connecting the support, gripper cylinder and segments includes means receptive of any engaging pair of a set of changeable transmission gears each having a given diameter for effecting a desired diameter ratio of integral numbers to define a corresponding motion ratio of integral numbers between the support and the gripper cylinder, whereby for a given label length, the number of segments and therefore the capacity of the machine are dependent upon the diameter ratio and can be selected corresponding to the diameter ratio of the selected gears.

4,092,208

METHOD OF GROWING SINGLE CRYSTALS OF RARE EARTH METAL IRON GARNET MATERIALS

John Chadwick Brice, Salfords, England, and John Mackay Robertson, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 633,283, Nov. 19, 1975, abandoned. This application May 6, 1977, Ser. No. 794,393

Claims priority, application United Kingdom, Nov. 27, 1974, 51392/74

Int. Cl.² B01J *17/18*; C01F *17/00*

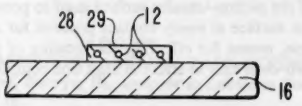
U.S. Cl. 156—624 **5 Claims**

1. In the method of growing a monocrystalline bismuth rare earth iron garnet from a melt consisting of a solution containing the constituents of the garnet by crystallization from said melt, the improvement wherein the solution in addition to said constituents contains a flux consisting essentially of a mixture of Bi_2O_3 and RO_2 wherein R is at least one element selected from the group consisting of Si, Ge, Ti, Sn, Zr, Ce and Te the proportion of Bi_2O_3 and RO_2 being such as to form a eutectic composition the eutectic temperature of which is below the melting temperature of pure Bi_2O_3 and the proportion of Bi_2O_3 in the solution being in excess of that required as a constituent of the garnet.

4,092,209
SILICON IMPLANTED AND BOMBARDED WITH PHOSPHORUS IONS

Alfred Charles Ipri, Princeton, N.J., assignor to RCA Corp., New York, N.Y.

Filed Dec. 30, 1976, Ser. No. 755,967
Int. Cl.[2] H01L *21/306*
U.S. Cl. 156—628 9 Claims



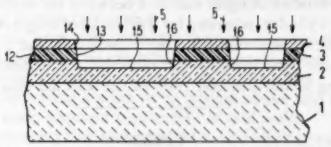
1. A body of silicon having at least a portion of a surface thereof substantially unetchable by a potassium hydroxide etchant wherein said surface portion contains therein phosphorus ions in the amount of at least 1×10^{16} ions per square centimeter which have been implanted in the body by bombarding said surface with the ions at a kinetic energy sufficient to implant the ions into the body.

4. A method for rendering a surface of silicon substantially unetchable by an anisotropic etchant comprising the steps of bombarding the silicon surface with at least approximately 1×10^{16} ions per square centimeter of phosphor ions at a kinetic energy such as to implant said ions into the silicon below said surface.

4,092,210
PROCESS FOR THE PRODUCTION OF ETCHED STRUCTURES IN A SURFACE OF A SOLID BODY BY IONIC ETCHING

Joachim Hoepfner, Planegg, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jul. 16, 1976, Ser. No. 705,785
Claims priority, application Germany, Aug. 18, 1975, 2536718
Int. Cl.[2] B44C *1/22*; C03C *15/00, 25/06*; C23F *1/02*
U.S. Cl. 156—643 22 Claims



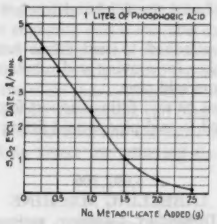
1. In a process for producing an etched structure in the surface of the solid body by providing a mask on the surface of the solid body, said mask leaving desired areas of the surface exposed, said solid body and said mask each being of a material that is disintegrated and removed by ion bombardment, and ionic etching said surface to remove the exposed portions, the improvement comprising increasing the disintegration rate of the mask material during a portion of the step of ionic etching.

4,092,211
CONTROL OF ETCH RATE OF SILICON DIOXIDE IN BOILING PHOSPHORIC ACID

John David Morris, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Nov. 18, 1976, Ser. No. 742,759
Int. Cl.[2] H01L *21/308*
U.S. Cl. 156—644 4 Claims

1. In a process for etching silicon nitride through apertures in a silicon dioxide mask in boiling phosphoric acid, the method of substantially reducing the etch rate of the silicon dioxide mask with substantially no reduction in the etch rate of the silicon nitride comprising adding material containing silicate to commercial quality phosphoric acid to add between

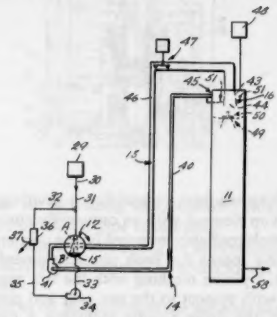


about 0.30 and 1.25 grams of silicate per liter of phosphoric acid.

4,092,212
SELECTIVE IMPREGNATION OF HETEROGENOUS FIBER MATERIAL BEFORE DIGESTION

Johan C. F. C. Richter, Nice, France, and Ole Johan Richter, Karlstad, Sweden, assignors to Kamyr Aktiebolag, Karlstad, Sweden

Filed Nov. 24, 1976, Ser. No. 744,977
Claims priority, application Sweden, Nov. 25, 1975, 7513217
Int. Cl.[2] D21C *3/24, 3/26, 7/06*
U.S. Cl. 162—19 2 Claims



1. A method for selective impregnation of fiber material before digestion thereof using a high-pressure valve connected to a continuous digester at a digester inlet adjacent the top thereof, the digester having an outlet disposed vertically above the digester inlet, said method comprising the steps of

(a) continuously feeding to the transfer valve under low-pressure liquid with entrained fiber material;

(b) continuously feeding from the transfer valve liquid under high pressure specifically containing both (i) fiber material sufficiently impregnated with said liquid and (ii) fiber material insufficiently impregnated with said liquid so that it has a density lesser than that of the liquid, directly to the continuous digester inlet;

(c) withdrawing liquid from the digester outlet at the top of the digester along with the fiber material of a density lesser than that of the liquid, while the fiber material with a density greater than that of the liquid descends into and forms a column in the digester;

(d) recirculating the withdrawn liquid and the fiber material of lesser density under pressure to the high-pressure transfer valve; and

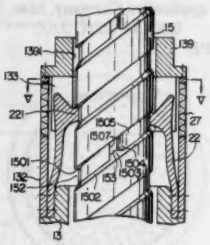
(e) continuously repeating steps (b)–(d) so that each individual portion of fiber material eventually will become sufficiently impregnated with liquid so that it will descend into and form a column in the digester.

4,092,213

CONTROL ROD DRIVES FOR NUCLEAR REACTORS

Akira Nishimura, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Mar. 30, 1976, Ser. No. 671,989
Claims priority, application Japan, Apr. 4, 1975, 50-40254
Int. Cl.[2] G21C 7/14
U.S. Cl. 176—36 R 42 Claims



2. A control rod drive for insertion and extraction of a control rod into and out of a core of a nuclear reactor comprising:

a piston reciprocally movable by fluid under pressure,

a drive rod having at least one helical groove on an outer circumferential surface thereof for transmitting a reciprocal movement of said piston to the control rod, and

collet fingers urged against said drive rod and engageable with said helical groove of said drive rod,

said helical groove and said collet fingers being shaped such that said drive rod is slowly moved during extraction of the control rod out of the core while rapidly movable during insertion of the control rod into the core,

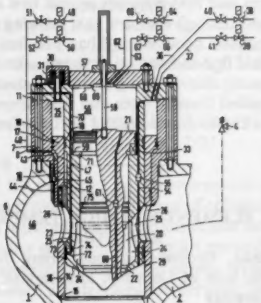
wherein said helical groove has a plurality of recesses therein for engagement with and locking of said collet fingers.

4,092,214

NUCLEAR REACTOR INSTALLATION

Hans-Peter Schabert, Erlangen, and Erwin Laurer, Mohrendorf near Erlangen, both of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim, Germany

Filed Aug. 4, 1976, Ser. No. 711,471
Claims priority, application Germany, Aug. 13, 1975, 2536199
Int. Cl.[2] G21C 9/00
U.S. Cl. 176—38 8 Claims



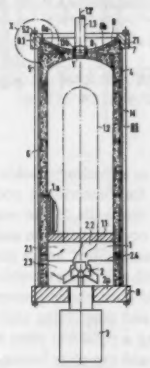
1. In a nuclear reactor installation having a containment shell, a steam generator disposed in the interior of the containment shell, a live steam line extending from the steam generator through the containment shell to the exterior thereof, a fast-acting shut-off valve having a main valve seat and a movable main valve plate opening and closing on the main valve seat connecting the live steam line to the steam generator, the main valve plate being closable on the main valve seat upon the occurrence of a leak in the live steam line, the valve and the line having substantially equal maximum aperture cross sections, pressure-dependent operating means for opening the main valve plate on the main valve seat at a pressure exceeding the operating pressure of the live steam line, and means for limiting the opening by the main valve plate on the main valve seat to at most about half the maximum aperture cross section, the main valve plate comprising a tubular slider and an auxiliary valve plate surrounded by said tubular slider, a fixed guide member mutually sealing said tubular slider and auxiliary valve plate, an auxiliary valve seat for said auxiliary valve plate formed in said guide member, said auxiliary valve plate being openable on said auxiliary valve seat with increasing steam pressure to provide a smaller aperture cross section.

4,092,215

RUPTURE PROTECTION DEVICE FOR STEAM GENERATORS OF SUBSTANTIALLY CYLINDRICAL SHAPE, PREFERABLY OF PRESSURIZED-WATER NUCLEAR POWER PLANTS

Josef Mutzl, Vienna, Austria, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim, Germany

Filed Sep. 29, 1976, Ser. No. 727,796
Claims priority, application Germany, Sep. 30, 1975, 2543663
Int. Cl.[2] G21C 9/00
U.S. Cl. 176—38 7 Claims



1. Rupture protection device for a steam generator of substantially cylindrical shape, the steam generator having a housing with a cover, comprising a rupture protection enclosure for surrounding the steam generator, said enclosure including a base, a cover and a jacket formed of tension-resistant and compression-resistant material, and axially stressable connecting means for connecting said base, said cover and said jacket to one another, said jacket being formed of substantially cylindrical sections, said cover being formed of a substantially concave spherical shell and a bearing ring, said spherical shell having an outer rim surface, said bearing ring being formed with an inner ring surface corresponding to said outer rim surface, said spherical shell being braced as a separate structural member through said outer rim surface thereof against said inner ring surface of said bearing ring, said bearing ring forming part of a bracing assembly comprising said base, said cover, and said substantially cylindrical jacket through the intermediary of said axially stressable connecting means, said spherical shell being divided into at least two partial shells, and a live steam line extending centrally out of the surface of the

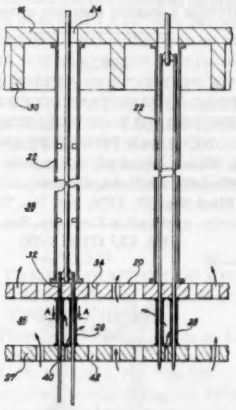
cover of the steam generator housing, said partial shells having a parting gap therebetween extending through a location at which the axis of the live steam line extends, said spherical partial shells being formed with sector-shaped recesses at a radially inner periphery thereof surrounding the live steam line.

4,092,216

NUCLEAR REACTOR

Gilles Aubert, Orsay, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Continuation-in-part of Ser. No. 529,905, Dec. 5, 1974, abandoned. This application May 5, 1976, Ser. No. 683,528
Claims priority, application France, Dec. 14, 1973, 73 44815
Int. Cl.² G21C *1/04*
U.S. Cl. 176—50 **7 Claims**



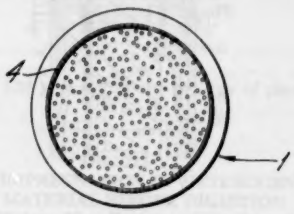
1. An improvement in a nuclear reactor which comprises a vessel having an inlet for receiving a coolant, a plurality of outlets spaced around the walls of the vessel for discharging said coolant, a reactor core disposed in said vessel and including a plurality of fuel assemblies, and a plurality of absorbing pins for cooperating with said fuel assemblies for regulating the neutron flux within said core, the improvement comprising an apparatus for guiding and supporting said pins in said vessel, said apparatus including a rigid top plate located in the upper portion of said vessel, said top plate having a plurality of apertures extending therethrough of a size sufficient to accommodate an assembly of said pins, an intermediate plate located in said vessel below said outlets, a bottom plate disposed between said intermediate plate and the bottom of said vessel, the top, intermediate and bottom plates being disposed above said core and being sized at least large enough to cover the reactor core, a plurality of elongated hollow members each having a cross-sectional shape and area sufficient to accommodate an assembly of said pins, the upper end portions of said members being secured to said top plate in registry with the apertures formed through said top plate, the lower end portions of said hollow members being connected to said intermediate plate, the intermediate and bottom plates including a pattern of apertures therein aligned with each of said hollow members each of said apertures being adapted to receive one of said pins therethrough, the apertures in the intermediate and bottom plates being aligned with each other and connected by a plurality of support members with openings therein in register with said apertures, the support members being rigidly connected to each of said intermediate and bottom plates for supporting the bottom plate relative to the intermediate plate.

4,092,217

FUEL ELEMENTS FOR NUCLEAR REACTORS AND METHOD FOR TESTING THE CIRCULATION OF FUEL ELEMENTS IN A CORE OF A NUCLEAR REACTOR

Fritz Schweiger, Hagen, Germany, and Wilfried Fritzsche, Graz, Austria, assignors to Hochtemperatur-Kernkraftwerk GmbH (HKG) Gemeinsames Europaisches Unternehman, Uentrop, Unna, Germany

Filed Mar. 28, 1974, Ser. No. 455,532
Claims priority, application Germany, Mar. 30, 1973, 2315847
Int. Cl.² G21C *3/00*
U.S. Cl. 176—58 PB **17 Claims**



1. A core formed by a circulating bulk charge of fuel elements for use in a nuclear reactor of the pebble bed type where the separate fuel elements are charged into the core through an inlet, move through the core from the inlet to the outlet and are removed from the core through the outlet, wherein the improvement comprises that the bulk charge of fuel elements comprises a plurality of separate first fuel elements and a plurality of separate second fuel elements with said first and second fuel elements being intermixed and being individually movable through the core, each of said first and second fuel elements having substantially the same exterior shape and size as to be exteriorly indistinguishable, each of said first and second elements comprising a similarly shaped inner body and a rim portion completely enclosing said inner body, said inner body of each of said first and second elements comprising a body of radioactive fuel and moderator material so that said first and second elements behave in the same way with regard to neutron flux, said rim portion of said first and second fuel elements comprising moderator material and being free of radioactive fuel, the outer surface of said rim portion of said first and second fuel elements having the same coefficient of friction, said rim portion of each of said second fuel elements including material marking said second elements with said rim portion of said first fuel elements being free of said material marking said second elements for differentiating said second elements from said first elements as said first and second fuel elements move through the core, said marking material having a greater electrical conductivity than said fuel and moderator material in said first and second elements whereby said second elements are capable of being identified electromagnetically and distinguished thereby from said first elements for measuring the flow rates of said second fuel elements through the core.

4,092,218

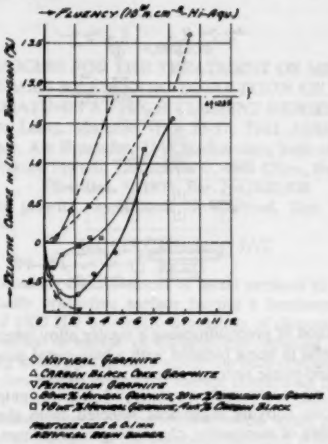
FUEL ELEMENT FOR HIGH TEMPERATURE REACTORS

Hans Huschka, Grossauehim, and Franz Josef Herrmann, Rodenbach, both of Germany, assignors to Nukem GmbH, Hanau, Germany

Continuation of Ser. No. 301,725, Oct. 30, 1972, abandoned. This application Aug. 28, 1974, Ser. No. 501,449
Claims priority, application Germany, Feb. 25, 1972, 2208855
Int. Cl.² G21C *5/00*
U.S. Cl. 176—84 **31 Claims**

1. A finished fuel element for high temperature reactors consisting of a block of structural graphite having bores therein filled with molded fuel compacts consisting of coated

fuel particles embedded in the graphite matrix, said fuel element having good heat transfer compared to block graphite from the fuel compact and graphite matrix to the structural graphite, wherein the graphite molding powder for fabrication of the graphite matrix consists of a member of the group consisting of (1) natural graphite and up to 15% binder by weight and (2) a mixture of graphite powders consisting of natural graphite, electrographite being present and in an amount of not



over 25% by weight and binder being present up to 25% by weight, and wherein relative to their initial ratio of sizes the ratio of the size of the graphite matrix to structural graphite increases with increasing irradiation, the fuel compacts being seated in the bores of the structural graphite without gap, and whereby due to the change in ratio of the size of the graphite matrix to structural graphite with increasing irradiation there is no gap in the bores when the reactor is in operation.

4,092,219

PREPARATION OF ENZYME-MEMBRANE COMPLEXES

Po-Min Lin, 714 Bevier Rd., Piscataway, N.J. 08854; Jack R. Giacin, 2 Stanworth La., Allentown, N.J. 08501; Seymour G. Gilbert, 74 N. Ross Hall Blvd., Piscataway, N.J. 08854, and Joseph G. Leeder, 379 Huff Rd., North Brunswick, N.J. 08902

Filed Aug. 13, 1975, Ser. No. 604,131
Int. Cl.² C07G 7/00, 7/02
U.S. Cl. 195—29 **14 Claims**

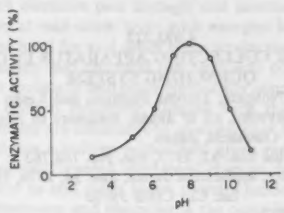
1. A method for preparing an enzyme-membrane complex which comprises providing a membrane of collagen, said collagen including a well-ordered crystalline region and a telopeptide region, treating said membrane with a proteolytic enzyme selected from the group consisting of pepsin, trypsin, pronase, and mixtures thereof at a temperature between about 15° and 25° C., and for a period of from about 1 to 12 hours, swelling said membrane at a pH of between about 2 and 12, washing said swollen membrane, and complexing an enzyme to said washed membrane by contacting said membrane with an aqueous solution of an enzyme, said contacting of said membrane with said enzyme being carried out for a period of between about 12 and 48 hours and at a temperature of between about 4° and 15° C.

4,092,220

PROCESS FOR MANUFACTURE OF L(+)-TARTARIC ACID OR SALTS THEREOF

Yoshihiro Tsurumi, Tokyo, and Tomio Fujioka, Matsudo, both of Japan, assignors to Mitsubishi Gas Chemical Co., Inc., Tokyo, Japan

Filed Apr. 16, 1976, Ser. No. 677,834
Claims priority, application Japan, Apr. 16, 1975, 50-46030
Int. Cl.² C12D 1/02
U.S. Cl. 195—30 **12 Claims**



1. A process for the manufacture of L(+)-tartaric acid or salts thereof, which comprises contacting cis-epoxysuccinic acid or a salt thereof with a substance containing cells of a microorganism belonging to the genus Acetobacter or the genus Corynebacterium having cis-epoxysuccinic acid-hydrolyzing activity, or a treated product thereof, in an aqueous medium, and subsequently collecting the produced L(+)-tartaric acid or salts thereof.

4,092,221

APPARATUS FOR BIOLOGICALLY MONITORING AIR QUALITY

Harold E. Schlichting, Jr., 151 S. Ridge St., Port Sanilac, Mich. 48469

Filed Apr. 10, 1975, Ser. No. 566,915
Int. Cl.² C12K 1/00
U.S. Cl. 195—127 **1 Claim**

1. An apparatus for determining air quality comprising an air tight and water tight chamber consisting of a clear tube divided longitudinally with a control area and an experimental area, both containing test organisms and a series of filters at one end of the chamber through which air passes, said filters in the control area comprising (1) a porous water filter having an extension for attaching to a water reservoir tube on top of said chamber, thereby providing humidity to all sections and to scrub the air of chemicals (2) a membrane filter disc on top of said water filter for removing all particulate matter larger than 0.2 to 1 Mμ from all sections of the chamber, (3) a semi-bonded

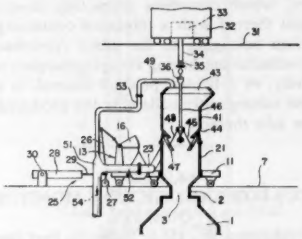
carbon filter disc on said membrane for removing chemicals from the air and (4) a filter foam disc on said carbon filter disc for removing large particulate matter; said filters in the experimental area comprising the same in the control area except the porous water filter has openings to allow chemicals to enter and there is no carbon filter disc.

4,092,222

TOP DUST COLLECTING APPARATUS IN COKE QUENCHING SYSTEM

Seiji Kataoka, Nohgata; Tutomu Shimizu, and Kesao Katwuno, both of Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Otemachi, Japan

Filed Jan. 12, 1977, Ser. No. 758,783
Claims priority, application Japan, Jan. 14, 1976, 51-2035[U]
Int. Cl.[2] C10B *39/02*
U.S. Cl. 202—227 3 Claims



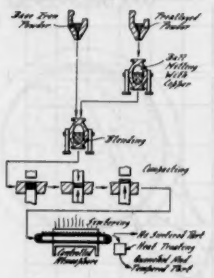
1. A coke dry quenching installation comprising:
a cooling chamber having a top charging opening;
a travelling crane above said cooling chamber;
a coke bucket on said travelling crane movable by said travelling crane to a position above said top charging opening and having a cover thereon;
a hopper chute between said coke bucket and said top charging opening on said cooling chamber and movable laterally toward and away from a position over said top charging opening, said hopper chute having a bottom opening which when the hopper chute is over the top charging opening is aligned in substantial gas tight alignment with said top charging opening and having a top opening, said coke bucket having a bottom opening which engages in sealing engagement with the top opening of said hopper chute when said coke bucket is lowered toward said cooling chamber by said travelling crane, and said coke bucket having a gate therewithin immediately above the bottom opening thereof which is automatically openable when said coke bucket is lowered onto said hopper chute; and
a waste gas collecting means for said installation, consisting of a first dust collecting duct extending from the cover of said coke bucket laterally thereof, a second dust collecting duct extending laterally from said hopper chute, a main dust collecting duct adjacent said cooling chamber, a first branch duct extending from said main duct and having a free end in a position where it is engaged by the free end of said first duct for connection thereto by the movement of said coke bucket into position on said hopper chute when said hopper chute is in position over said top charging opening, and a second duct extending from said main duct and having a free end in a position where it is connected to the free end of said second duct when said hopper chute is in position over said top charging opening of said cooling chamber.

4,092,223

COPPER COATED, IRON-CARBON EUTECTIC ALLOY POWDERS

Sydney M. Kaufman, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 584,562, Jun. 6, 1975, Pat. No. 4,011,077.
This application May 14, 1976, Ser. No. 686,619
Int. Cl.[2] C22D *5/00*; C25D *1/00, 5/00*
U.S. Cl. 204—23 5 Claims



1. A method of preconditioning a master alloy intermediate powder useful in being blended with a base metal powder for making liquid-phase sintered shapes, comprising:
(a) selecting an iron-carbon-prealloyed powder containing at least one alloying ingredient selected from the group consisting of manganese, chromium, molybdenum, nickel, copper, vanadium, said alloying ingredients each being present in an amount of about 2.5% by weight and the total of said alloying ingredients being in the range of 0.5–20% by weight,
(b) sizing said iron-carbon-alloy powder to a mesh size of −100, and
(c) substantially enveloping each particle of said iron-carbon-alloying powder with a metal which can be dissolved in said prealloyed powder and which is effective to act as a barrier to carbon diffusion in the solid state condition and which barrier metal remains substantially solid only up to the point of melting of said prealloyed powder, said envelope having a thickness of about 200 microns.

4,092,224

PROCESS OF ZINC COATING FASTENERS

Hans Edvin Åke Eriksson; Bengt Sune Käberg, and Nils Torsten Rehnovist, all of Hallstahammar, Sweden, assignors to Bulten Kanthal Aktiebolag, Sweden

Filed Jun. 24, 1976, Ser. No. 699,503
Claims priority, application Sweden, Jun. 25, 1975, 7507293
Int. Cl.[2] C25D *5/34, 7/02*
U.S. Cl. 204—32 R 6 Claims

1. A process of zinc coating fasteners comprising the steps of:
(a) applying a first zinc coat to the fasteners by heat coating;
(b) equalizing said first zinc coat electrochemically; and
(c) applying a second, superficial zinc coat to said first zinc coat by electro-coating.

4,092,225

HIGH EFFICIENCY PALLADIUM ELECTROPLATING PROCESS, BATH AND COMPOSITION THEREFOR

Thomas Francis Davis, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 742,482, Nov. 17, 1976, abandoned. This application Jun. 22, 1977, Ser. No. 808,754
Int. Cl.[2] C25D *3/50*; C09K *3/00*
U.S. Cl. 204—47 6 Claims

5. An electrolyte bath composition suitable for electrodeposition of palladium on a substrate, said bath comprising: palla-

dium metal, wherein the same is in an amount from 4 to 18 grams per liter and is added as $Pd(NH_3)_2(NO_2)_2$ and tetra potassium pyrophosphate, in an amount from 5 to 300 grams per liter, balance water, and for pH adjustment between 8.5 to 11.0, pyrophosphoric acid, or potassium hydroxide.

6. A salt composition, suitable for dilution as an electrolyte for the electrodeposition of palladium, comprising $Pd(NH_3)_2(NO_2)_2$, $K_4P_2O_7$ and at least one compound selected from the group consisting of pyrophosphoric acid and potassium hydroxide.

4,092,226

PROCESS FOR THE TREATMENT OF METAL SURFACES BY ELECTRO-DEPOSITION OF METAL COATINGS AT HIGH CURRENT DENSITIES

Nikolaus Laing, Hofener Weg 35-37, 7141 Aldingen; Peter Schaper, Am Remsufer, 7141 Neckarrems, both of Germany, and Werner Heierli, Elsastrasse 6, 4600 Olten, Switzerland

Filed Dec. 8, 1975, Ser. No. 638,928

Claims priority, application Switzerland, Dec. 11, 1974, 16501/74

Int. Cl.² C25D *3/04, 3/10*

U.S. Cl. 204—51 **1 Claim**

1. Process for the treatment of metal surfaces to produce a substantially crack-free surface having a hardness factor in excess of 1500 HV by electro-deposition of chromium at current densities in excess of 100amp/dm² utilizing electrodes extending into a plating bath where the bath contains an aqueous solution having chromium therein comprising the steps of including in the bath a compound having a complex halogen which disassociates in an aqueous solution while maintaining the bond of halogen in the complex, applying a base voltage across the electrodes which is larger than the precipitation potential of the deposited chromium and smaller than the precipitation of hydrogen in the plating bath, and periodically superimposing high voltage pulses on the base voltage wherein the high voltage pulses are 3 to 7 times greater than the base voltage.

4,092,227

PROCESS FOR CATALYZING CHEMICAL REACTIONS

Walter Haidinger, Geneva, Switzerland, assignor to Battelle Development Corporation, Columbus, Ohio

Continuation of Ser. No. 612,280, Sep. 11, 1975, abandoned, which is a continuation of Ser. No. 553,123, Feb. 26, 1975, abandoned, which is a continuation of Ser. No. 303,966, Nov. 6, 1972, abandoned. This application Jun. 30, 1976, Ser. No. 701,307

Claims priority, application Switzerland, Nov. 11, 1971, 16476/71

Int. Cl.² B01K *1/00*

U.S. Cl. 204—59 R **9 Claims**

1. A process for selectively accelerating the neterogeneous reaction of fluid chemical reactants comprising reactant molecules to desired reaction products by electronic means comprising the steps of

(a) providing an m-d-M layered electronic element comprising an inner electrically conductive support (M), a thin outer layer of an electrically conductive material (m) capable of chemisorbing the reactant molecules on an outer surface thereof, and an intermediate film (d) of insulating or semiconducting material separating said inner support and said outer layer, said intermediate film having a thickness of 50–1500 A and electrical properties such that if a voltage within a given range of voltages is applied across said layered electronic element from said inner support to said outer layer, a current is produced therebetween by moving electrons, at least a portion of which electrons pass through said intermediate film and arrive at said outer layer with energies in excess of the Fermi level for said outer layer conductive material;

(b) bringing said chemical reactants into contact with the outer surface of said outer electrically conductive layer of said layered electronic element such that the reactant molecules are chemisorbed as complexes thereon;

(c) applying a voltage within said given range of voltages across said layered electronic element from said inner support to said outer layer, thereby producing a current therebetween and electrons in the outer layer with energies in excess of the Fermi level and thereby increasing the rate of reaction of the chemical reactant complexes to chemical products at the outer surface as a function of said current; and

(d) adjusting said voltage within said range of voltages to favor production of said desired reaction product.

4,092,228

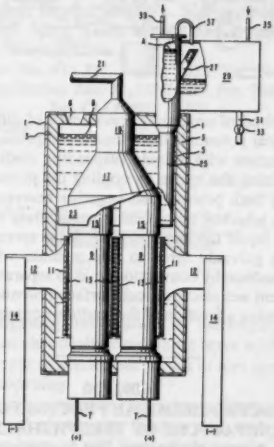
ELECTROLYTIC CELL

Francis Joseph Ross, Niagara Falls, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 7, 1977, Ser. No. 775,280

Int. Cl.² C25C *3/02, 3/00*

U.S. Cl. 204—68 **3 Claims**



1. In a Downs-type cell for the production of alkali metal by electrolysis of molten salts thereof having (1) means for the collection of gas from the anode positioned within the perimeter of (2) collector means for the removal of molten alkali metal to (3) a riser/cooler pipe through which molten alkali metal rises in non-turbulent flow by specific gravity difference to a predetermined level higher than the level of the molten salt within the cell and flows into (4) an inert gas-blanketed receiver in which the molten metal is maintained in the molten state prior to removal from the cell, the improvement comprising in combination

(a) a sealed weir connected to the riser/cooler pipe at a point below the level of molten metal within the riser/cooler

pipe and extending into the receiver to a level within the receiver corresponding to the predetermined level of molten metal within the riser/cooler pipe, the riser/cooler pipe having a small vapor space above the molten metal level as compared with the vapor space of the receiver;

(b) an inert gas vent extending between the vapor space of the receiver and the vapor space of the riser; and

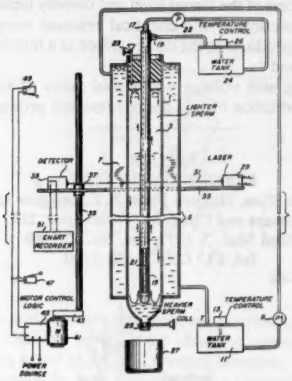
(c) means for venting inert gas from the receiver through the vapor space of the riser/cooler.

4,092,229

THERMAL CONVECTION COUNTER STREAMING SEDIMENTATION AND FORCED CONVECTION GALVANIZATION METHOD FOR CONTROLLING THE SEX OF MAMMALIAN OFFSPRING

Bhairab C. Bhattacharya, 5016 S. 87th St., Omaha, Nebr. 68127

Continuation-in-part of Ser. No. 641,501, Dec. 17, 1975, which is a division of Ser. No. 526,378, Nov. 22, 1974, Pat. No. 3,976,197.
This application Oct. 20, 1976, Ser. No. 734,243
Int. Cl.[2] G01N *27/26*
U.S. Cl. 204—180 R **21 Claims**



1. A method of separating sperm cells of differing densities and electrical potentials from semen comprising the steps of:

mixing semen with a liquid suspending medium;

immobilizing the sperm by cooling the mixture;

applying both positive and negative buoyant forces to the sperm whereby more dense sperm attain a different level in the liquid medium than less dense sperm;

applying galvanic force to said medium while circulating said medium by convection so as to separate sperm having different net electrical cell surface potentials; and

withdrawing a fraction of the medium containing the desired sperm.

4,092,230

ELECTROCHEMICAL PROCESS FOR THE MANUFACTURE OF TEREPHTHALIC ACID

Richard V. Norton, Wilmington, Del., assignor to Suntech, Inc., Wayne, Pa.

Filed Mar. 10, 1977, Ser. No. 776,454
Int. Cl.[2] C25B *3/00*; C07C *51/08, 63/26, 63/28*
U.S. Cl. 204—180 P **7 Claims**

1. A process for the preparation of terephthalic acid which comprises electrolyzing in the anode compartment of an electrolysis cell wherein said anode compartment is separated from the cathode compartment by a cation selective membrane, an aqueous suspension of potassium acid terephthalate at a molar concentration of from about 0.2 to about 1.0 and containing a potassium salt of an acid having a pK_a greater than 4.8 to form an aqueous suspension of terephthalic acid and separating said terephthalic acid product, said electrolysis being conducted at a temperature of from about 20° to about 120° C, at a pH of from about 3 to about 4, a current density of from about 100 to about 500 amps per square foot, and at a voltage of from about 5 to about 12 volts.

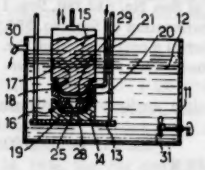
5. A process for the preparation of terephthalic acid which comprises hydrolyzing terephthalonitrile in an aqueous medium containing dipotassium terephthalate, potassium bicarbonate and potassium hydroxide at a temperature of between about 100° and about 250° C, stripping ammonia and CO_2 from the aqueous medium, adding CO_2 to the stripped aqueous solution to precipitate potassium acid terephthalate, repulping said separated potassium acid terephthalate to obtain an aqueous suspension of from about 0.2 to about 1.0 moles per liter of potassium acid terephthalate and subjecting said suspension containing a potassium salt of an acid having a pK_a above 4.8 to electrolysis in the anode compartment of an electrolysis cell wherein said anode compartment is separated from the cathode compartment by a cation selective membrane to form an aqueous suspension of terephthalic acid and separating said terephthalic acid product, said electrolysis being conducted at a temperature of from about 20° to about 120° C, at a pH of from about 3 to about 4, a current density of from about 100 to about 500 amps per square foot, and at a voltage of from about 5 to about 12 volts.

4,092,231

METHOD OF PREPARING BY ELECTROPHORESIS A SHAPED ARTICLE CONSTITUTED BY AGGLOMERATED PARTICLES AND A DEVICE FOR CARRYING OUT THE SAID METHOD

Sten Chronberg, Arnieres-sur-Iton, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), France

Filed Mar. 17, 1977, Ser. No. 778,387
Claims priority, application France, Mar. 23, 1976, 76 08388
Int. Cl.[2] C25D *1/14, 1/20, 13/00*
U.S. Cl. 204—181F **12 Claims**

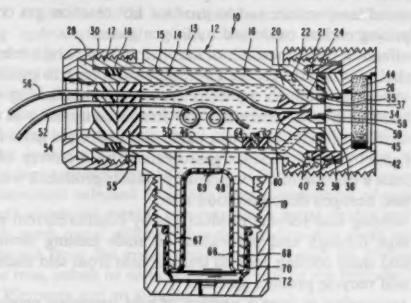


1. A method of preparing by electrophoresis a shaped article constituted by particles agglomerated together from a suspension in a liquid, the said article having sufficient cohesion to allow its subsequent working by any known method or technique, characterized in that the suspension is supplied into a space defined between two mutually confronting electrodes, the mutually confronting portions of which have substantially the shape of the said article, i.e. the shape of its indented or concave portion and of its raised or convex portion, respectively, the suspension in the said space is subjected for a certain time to an electrophoresis effect between the said electrodes which are subjected to a given voltage and an adjacent counter-electrode which is subjected to a different voltage, the said electrodes are moved closer to one another, when the electrophoretic deposits have reached a desired thickness thereon, so as to join and compress together the said deposits, and thereafter the said electrodes are moved apart to release the said article thus formed.

4,092,232
H_2S DIRECT GAS SENSOR

Mark S. Zetter, Santa Clara, Calif., assignor to Dictaphone Corporation, Rye, N.Y.

Continuation-in-part of Ser. No. 625,857, Oct. 28, 1975, abandoned. This application Mar. 18, 1977, Ser. No. 778,875
Int. Cl.[2] G01N 27/46
U.S. Cl. 204—195 P 17 Claims



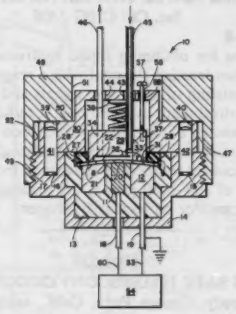
1. An improved electrochemical electrode structure of the potentiometric type having a single housing, the housing containing a reference electrolytic solution, an active electrolytic solution, separate reservoirs for the reference solution and the active solution, porous means for restricted fluid communication between the separate reservoirs, a reference electrode disposed in the reference solution reservoir, a gas permeable, hydrophobic membrane having one surface exposed to the exterior of the housing and another surface exposed to the interior of the housing, a sensing element spaced closely adjacent to the surface of the membrane exposed to the interior of the housing, and means for providing fluid communication between the active solution reservoir, the surface of the membrane exposed to the interior of the housing and the sensing element, such that a predetermined electrical potential exists between the reference electrode and the sensing element for a given concentration of a select gas in the ambient atmosphere at a constant ambient temperature, and wherein the improvement comprises a buffer mixture within the active solution to maintain the electrical potential between the reference electrode and the sensing element substantially constant for a constant temperature of the active and reference solutions despite a varying ambient humidity exterior of the membrane, and wherein the buffer mixture includes phosphates and a buffer selected from the group consisting of triethanolamine and hydroxymethyl aminomethane.

4,092,233
MEMBRANE APPARATUS

Anton Hubert Clemens, and Peter Hon Chang, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 641,978, Dec. 18, 1975, abandoned. This application May 6, 1976, Ser. No. 683,807
Int. Cl.[2] G01N 27/46
U.S. Cl. 204—195 P 3 Claims

1. Apparatus employing a semi-permeable membrane wherein the membrane is supported against a surface and wherein the likelihood of damage to such membrane during mounting and use is minimized comprising in combination a first member formed with a recess having a cylindrical sidewall and a bottom having a convex surface, a membrane, an annular gasket, a second member having a concave end surface and clamping means, said second member fitting within said gasket and positioning said membrane against said first member wherein said membrane is stretched over said convex surface of said first member by the complemental concave end surface of said second member to effect close contact between said membrane and said convex surface, said annular gasket in an unstressed condition loosely fitting within said cylindrical sidewall of said recess of said first member, any fluid located between said membrane and said convex surface of said first membrane being forced outward by said membrane stretching and being allowed to pass through the space formed by the loose fitting relationship between said annular gasket and said

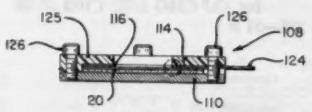


cylindrical sidewall of said first member, said clamping means applying compressive force to said annular gasket and to said second member to form a fluid-tight seal between said cylindrical sidewall of said first member and said second member through said annular gasket and to hold said membrane in stretched relationship against and in close contact with said first member.

4,092,234
METHOD OF FABRICATING DIFFRACTION GRATING MASTERS AND APPARATUS THEREFOR

William R. Horst, Dayton; James L. McNaughton, Kettering, and Charles F. Mort, Xenia, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Division of Ser. No. 611,377, Sep. 8, 1975, Pat. No. 4,044,939. This application Jan. 31, 1977, Ser. No. 764,495
Int. Cl.[2] C25D 17/06
U.S. Cl. 204—286 1 Claim



1. An electroplating frame means for electroplating a layer of metal onto an electrically conducting layer which is superimposed on a layer of photoresist which in turn is mounted on a substrate, comprising:

a planar support member for receiving said substrate having said layer of photoresist thereon and said electrically conducting layer on said layer of photoresist, which said electrically conducting layer is to be electroplated;

a planar peripheral type electrode having a surface for contacting said electrically conducting layer to be electroplated and also having an opening therein to enable electroplating of said electrically conducting layer;

means for securing said planar peripheral type electrode to said planar support member; and

said planar peripheral type electrode having a tapered surface in said surface next to said opening to enable a portion of the layer of metal which is to be electroplated to form between said tapered surface and said electrically conducting layer, thereby locking said layer of metal which is electroplated in place under said peripheral type electrode.

4,092,235
TREATMENT OF COAL BY ALKYLATION OR ACYLATION TO INCREASE LIQUID PRODUCTS FROM COAL LIQUEFACTION

Richard H. Schlosberg, New Providence, N.J.; Peter S. Maa, and Richard C. Neavel, both of Baytown, Tex., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Nov. 26, 1975, Ser. No. 635,706
Int. Cl.[2] C10G *1/06*
U.S. Cl. 208—8 **18 Claims**

1. A process for obtaining liquid hydrocarbons from coal which comprises treating the coal with a reagent selected from the group consisting of alkylating agents and acylating agents and thereby introducing into the coal a radical selected from the group consisting of aliphatic hydrocarbon radicals and acyl radicals respectively and thereafter liquefying at least a portion of the treated coal at temperatures ranging from 600°–1000° F. and pressures of 300–3000 psig in the presence of a hydrogen donor solvent and/or molecular hydrogen.

4,092,236
MOLTEN SALT HYDROCONVERSION PROCESS

Laszlo A. Heredy, Canoga Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

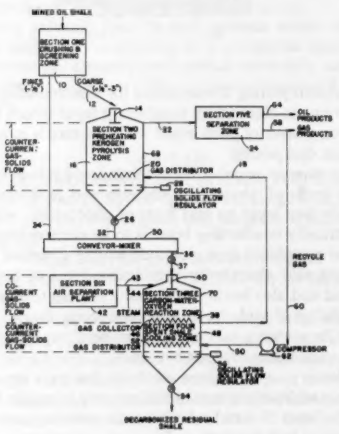
Filed Aug. 30, 1976, Ser. No. 718,731
Int. Cl.[2] C10G *1/08*
U.S. Cl. 208—10 **8 Claims**

1. A process for hydrocracking coal comprising:
introducing coal into a molten sale bath maintained in a reaction zone at a temperature of from about 350° to about 550° C;
introducing hydrogen into the reaction zone an amount sufficient to provide a pressure in the reaction zone within the range of from about 30 to 500 atmospheres; and
reacting said coal for a time sufficient to produce cracked products including liquid, gaseous and solid products of enriched hydrogen content, said molten salt bath comprising a major amount of at least one alkali metal hydroxide.

4,092,237
PROCESS FOR TREATING OIL SHALES

Homer Charles Reed, Laguna Beach, Calif., assignor to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Jun. 13, 1977, Ser. No. 805,829
Int. Cl.[2] C10G *1/02*; C10B *53/06*
U.S. Cl. 208—11 R **5 Claims**



1. A process for producing crude shale oil and gas comprising:

a. passing particulate oil shale through a first vertical, refractory-lined kiln comprising a shale heating-kerogen decomposition zone into a second vertical, refractory-lined kiln comprising a carbon-water-oxygen reaction zone and a shale cooling zone;

b. passing a gas stream containing oxygen and steam into the carbon-water-oxygen reaction zone concurrently with the particulate oil shale passing therethrough under conditions to further heat said particulate oil shale to an elevated temperature and to produce hot reaction gas comprising carbon oxide and hydrogen gases;

c. effecting decomposition of kerogen in said particulate oil shale within said kerogen decomposition zone to produce vaporous products by countercurrently contacting the same with a hot combined gas stream comprising an admixture of said hot carbon oxide and hydrogen gases and heated recycle product gas obtained by recovery of at least a portion of the vaporous products produced within said kerogen decomposition zone;

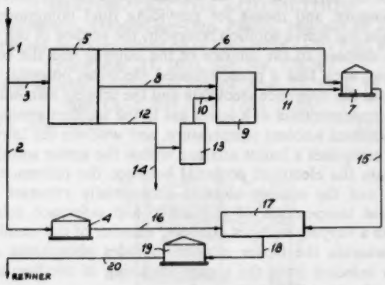
d. heating said recycle product gas by countercurrent passage through said particulate oil shale passing through said shale cooling zone to transfer heat from said shale to said recycle product gas; and

e. recovering at least a portion of said vaporous products from said kerogen decomposition zone.

4,092,238
PROCESS FOR PRODUCING LOW DENSITY LOW-SULFUR CRUDE OIL

Mario Iona, Via Boscovich 55, Milan, Italy

Filed Nov. 19, 1976, Ser. No. 743,443
Int. Cl.[2] C10G *37/00*
U.S. Cl. 208—80 **6 Claims**



1. A substantially quantitative process for converting naturally occurring heavy oils having API gravities up to 35, into low density crude oil of low sulfur content which comprises the steps of:

(a) dividing a high density, starting crude oil into a dilution stream and a base stream, the volume ratio of the dilution stream and a base stream, the volume ratio of the dilution stream to the base stream being about 25 to about 60 percent of the total;

(b) separating the dilution stream into a straight run light fraction boiling below about 662°–698° F., a medium fraction boiling above about 662°–698° F., and an asphaltic residue;

(c) hydrocracking said medium fraction;

(d) mixing said hydrocracked fraction and said light fraction, the volumetric sum of said straight run light fraction and said hydrocracked fraction being at least equal to the volume of the original dilution stream; and

(e) combining the product from step (d) with the base stream to produce a crude oil having a lower density and a lower sulfur content than the starting crude oil.

4,092,239

HYDRODESULFURIZATION OF OIL UTILIZING A CATALYST OF RARE EARTH METAL, NON-RARE EARTH METAL AND ALUMINA SUPPORT

William R. Moser, Wayland, Mass., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Jan. 5, 1976, Ser. No. 646,632
Int. Cl.[2] C10G 23/02
U.S. Cl. 208—213 13 Claims

1. A process for the hydrodesulfurization of a sulfur-containing hydrocarbon oil, which comprises: contacting said oil under hydrodesulfurization conditions with hydrogen and a catalyst consisting essentially of a rare earth metal component selected from the group consisting of elemental rare earth metals, rare earth metal oxides and rare earth metal sulfides wherein said rare earth metal of said rare earth metal component is selected from the group of elements having atomic numbers ranging from 58 to 71, and (b) a non-rare earth metal component selected from the group consisting of non-rare earth elemental metals, non-rare earth metal oxides and non-rare earth metal sulfides wherein said non-rare earth metal is selected from the group consisting of Group IB, Group IIB and iron, cobalt or nickel of Group VIII of the Periodic Table of Elements and an alumina support.

4,092,240

REFRIGERATION OIL PROCESSING

Theodore C. Mead, Port Neches; Avilino Sequeira, Jr., Port Arthur, and Norman R. Odell, Nederland, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Jun. 29, 1977, Ser. No. 811,333
Int. Cl.[2] C10G 25/00
U.S. Cl. 208—301 8 Claims

1. A method of making refrigeration oils comprising:
(a) contacting a naphthene oil with an oxygen-containing gas selected from the group consisting of air, oxygen, ozone, nitrogen oxides, and mixtures thereof, and with a catalyst comprising an alkali or alkaline earth metal salt of permanganate at a temperature below 275° F and a pressure ranging up to about 300 psi,
(b) introducing the oil separated from step (a) into the upper portion of a fixed bed adsorbent and adsorbing said oil on said adsorbent
(c) eluting said adsorbent with a solvent to elute from said adsorbent and eluate oil fraction, and
(d) separating said solvent from said eluate oil fraction to recover a refrigeration oil product.

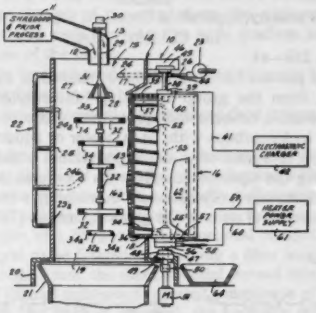
4,092,241

ELECTROSTATIC SEPARATION OF PLASTIC FILM FROM SHREDDED WASTE

Harold B. Mackenzie, Wheaton, Ill., and Ingvar G. Anderson, Dunedin, Fla., assignors to New Life Foundation, Wheaton, Ill.

Filed Dec. 23, 1976, Ser. No. 753,775
Int. Cl.[2] B03C 7/06
U.S. Cl. 209—127 A 16 Claims

9. A waste separation system adapted for separation of shredded plastic material from processed shredded waste paper comprising:
(a) means having a waste separation chamber providing a substantially vertically oriented passageway through which the shredded waste paper and plastic descends;
(b) processed shredded waste delivery means positioned to deliver into the top end of said passageway;
(c) a rotating separator having a surface area portion exposed to said passageway;
(d) means for effecting circulation of the shredded waste paper and plastic in said passageway toward said surface area portion;
(e) means for heating said surface area portion of the rotating means for holding the shredded plastic material to the surface area portion and thereby separating the shredded plastic waste from the shredded waste paper;



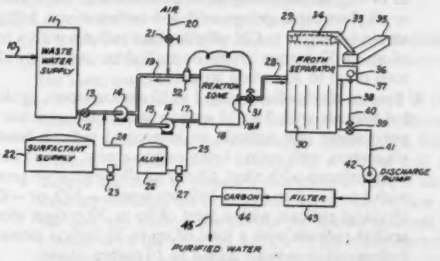
(f) means for removing the plastic waste from said surface area outside of said passageway;
wherein said means for effecting circulation comprise a combination of induced air and mechanical circulation promoting devices.

4,092,242

WASTE WATER PURIFICATION SYSTEM

Thomas N. Deane, New Orleans, La., assignor to The Redux Corporation, St. Louis, Mo.

Filed Jun. 16, 1975, Ser. No. 587,426
Int. Cl.[2] B01D 13/00, 17/04; B03D 1/26
U.S. Cl. 210—23 F 7 Claims



1. The process of reclaiming waste water from a washing operation employing syndets which comprises adding to said waste water a water-insoluble anionic surfactant oil, emulsifying said syndets and added surfactant by the action of the detergents contained in said waste water, and breaking said emulsion to produce clear water suitable for reuse in washing and rinsing in the washing operation.

2. The process of claim 1 wherein the amount of surfactant added to the waste water is from 50 to 5000 parts per million parts of water.

4,092,243

POLYCARBONATES

Dieter Neuray, Rumeln-Kaldenhausen; Hugo Vernaleken, Krefeld, and Hans Rudolph, Krefeld-Bockum, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

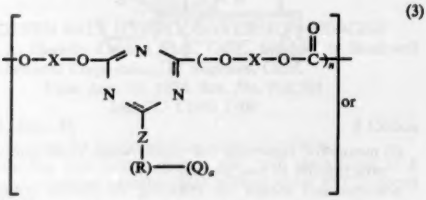
Division of Ser. No. 506,158, Sep. 16, 1974, Pat. No. 3,957,728, which is a continuation-in-part of Ser. No. 397,502, Sep. 14, 1973, Pat. No. 3,894,991. This application Feb. 4, 1976, Ser. No. 655,300

Claims priority, application Germany, Sep. 18, 1973, 2346935

Int. Cl.[2] B01D *15/08*

U.S. Cl. 210—41 2 Claims

1. In a process for the absorptive removal of hydrocarbons selected from the group consisting of methylene chloride, chlorobenzene, benzene and xylene from mixtures or solutions of these hydrocarbons with, or in, water or aqueous solutions containing inorganic salts, the improvement which comprises contacting the aqueous mixture with a column of flocculent very voluminous polycarbonate containing s-triazine rings, having structural units of the general formula (3),

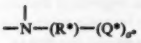


(3)

in which

Q denotes —COOH or —SO_3H,

Z represents —O—, —S—, —NH— or —NR^1— or



R and R* are identical or not identical and denote alkylene radicals with 1–20 carbon atoms, cycloalkylene radicals with 5–12 carbon atoms, mononuclear or polynuclear arylene radicals, or heteroarylene radicals bonded via carbon, with up to 14 carbon atoms, monosubstituted or polysubstituted mononuclear or polynuclear arylene radicals, or heteroarylene radicals bonded via carbon, with up to 14 ring carbon atoms and substituted with alkyl, alkoxy or alkylmercapto groups with 1–4 carbon atoms, halogen atoms, —NO_2 or —CN, alkylarylene radicals with a total of up to 30 carbon atoms or aralkylene radicals with a total of up to 30 carbon atoms,

R^1 denotes alkyl radicals with 1 to 20 carbon atoms, cycloalkyl radicals with 5 to 12 carbon atoms, mononuclear or polynuclear aryl radicals, or heteroaryl radicals bonded via carbon, with up to 14 ring carbon atoms, unsubstituted or substituted with alkyl, alkoxy or alkylmercapto groups with 1 to 4 carbon atoms, halogen atoms, —NO_2 or —CN, alkylaryl radicals with a total of up to 30 carbon atoms, aralkyl radicals with a total of up to 30 carbon atoms or hydroxyalkyl radicals with 1 to 10 carbon atoms,

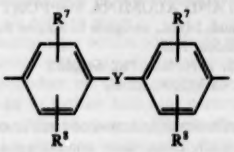
Q* denotes a —COOH, —$COOR^2$, —$CONR^3R_4$, —SO_3H, —$SO_2NR^3R^4$ or aliphatic OH group,

R^2 represents alkyl groups with 1–4 carbon atoms,

R^3 and R^4 independently of one another represent hydrogen, straight-chain or branched alkyl groups with 1–4 carbon atoms or an unsubstituted, monosubstituted or polysubstituted phenyl radical or conjointly with the N atom form 5-membered or 6-membered ring system, and

a and *a** are identical or not identical and denote a integer of from 1 to 4 inclusive,

X denotes an o-, m- or p-phenylene radical or an o-, m- or p-phenylene radical, monosubstituted or polysubstituted with alkyl groups having 1–4 carbon atoms or halogen atoms or denotes a radical characterized by the formula 5

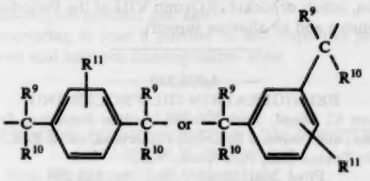


(5)

in which

R^7 and R^8 represent hydrogen atoms, alkyl radicals with 1–4 carbon atoms or halogen atoms and have identical or different meanings, and

Y denotes a single bond, an alkylene or alkylidene radical with 1–7 carbon atoms, a cycloalkylene or cycloalkylidene radical with 5 to 12 carbon atoms, —O—, —S—, —CO—, —SO—, —SO_2— or a radical of the formula 6*a* or 6*b*



(6a) (6b)

wherein

R^9 to R^{11} denote alkyl radicals with 1–4 carbon atoms and R^{11} can also represent hydrogen or halogen atoms, and is an integer between 1 and 200.

4,092,244

CORROSION AND SCALE INHIBITORS FOR INDUSTRIAL RECIRCULATING COOLING WATER SYSTEMS

Tzeng Jiueq Suen, New Canaan, and Arthur James Begala, Jr., Fairfield, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 595,651, Jul. 14, 1975, Pat. No. 4,003,842. This application Aug. 19, 1976, Ser. No. 715,809

The portion of the term of this patent subsequent to Jan. 18, 1994, has been disclaimed.

Int. Cl.[2] C02B *5/06*

U.S. Cl. 210—58 13 Claims

1. A process for inhibiting corrosion and scaling on metal surfaces in water systems comprising: adding to water in said systems of from 10 to 200 ppm of additive selected from compounds having the general formula:

$$R(OCH_2CH_2)_mO(CH_2)_x\,CHR'—Z'$$

wherein:

R is a hydrocarbon radical of 8 - 22 atoms;

m is an integer of 1 - 6;

x is 0 or 1;

R' is Hydrogen or methyl; and

Z' is COOM, SO_3M or $PO(OM)_2$ — where M is H or an alkali metal.

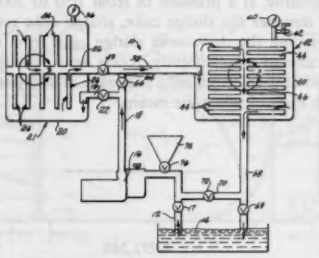
4,092,245
LIQUID PURIFICATION METHOD

Robert E. Franks, deceased, late of Los Alamitos, Calif., and by Dorothy G. Franks, administratrix, Redding, Calif., assignors to Goetz, Trustee Sylvia, Altadena, Calif.

Continuation-in-part of Ser. No. 697,543, Jun. 18, 1976, abandoned, which is a continuation of Ser. No. 553,080, Feb. 26, 1975, abandoned, which is a continuation of Ser. No. 363,943, May 25, 1973, abandoned. This application Apr. 7, 1977, Ser. No. 785,698

Int. Cl.[2] C02B 3/10

U.S. Cl. 210—64 17 Claims



1. In a method of sanitizing pool water which includes circulating the water periodically from a pool through a filter under pump pressure to remove any suspended solids present in the pool water, and returning the filtered pool water to the pool, the steps of:

contacting said filtered pool water with a stationary bed of porous biocatalyst composition by repetitive circulation of the pool water through the porous bed;

the porous bed having a protective first layer of filteraid material on the surface of a filter element, the layer of biocatalyst composition being formed on the first layer of filteraid, with a protective second layer of filteraid being formed on the biocatalyst layer;

said biocatalyst composition consisting essentially of a reaction product of a finely divided, water-insoluble mixture of a basic silver compound, carbon or silica particles, and a basic metal oxide or hydroxide, the finely divided basic metal oxide or hydroxide being selected from the group consisting of zinc oxide, alumina, aluminum hydroxide, bismuth trioxide, magnesium oxide, and titanium oxide;

said biocatalyst composition being responsive to repeated pool water contact to generate a purifying residual microbicial condition in the pool water;

maintaining the pool water, the porous bed, the pool water circulated to the porous bed, and the water circulated away from the porous bed to the pool at a pH above 7 and at a temperature between about 70° F and about 98° F;

returning the conditioned water to the pool; and

recontacting the conditioned water with said biocatalyst composition to maintain said residual microbicidal condition.

4,092,246
HELICALLY WOUND BLOOD FILTER

Frederick J. Kummer, Boston, Mass., assignor to Abcor, Inc., Wilmington, Mass.

Continuation of Ser. No. 578,330, May 16, 1975, abandoned. This application May 19, 1977, Ser. No. 798,666

Int. Cl.[2] B01D 37/00

U.S. Cl. 210—65 39 Claims

1. A filter for a fluid stream which comprises in combination:

(a) a filter housing adapted to contain a filter element;

(b) a filter element disposed in the housing having an upstream end and a downstream end, and which element comprises a helically coiled strip of sheet material containing, on at least one surface thereof, a surface layer of fibrous flocked material, the sheet material wound into a helical coil of desired tightness within the housing, so as to prevent a multitude of channels through the flocked material to the fluid stream which passes axially through the coiled strip, the flocked material selected to remove particles from the fluid stream to be filtered, the helically coiled strip being wound such that an increasing gradient in the tightness of the wind from the upstream to the downstream ends provides for both gradient and depth filtration of the blood;

(c) an inlet for the introduction of a fluid stream to be filtered into the housing; and

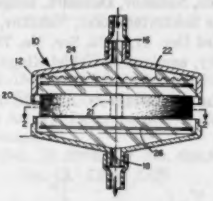
(d) an outlet for removal of the filtered fluid stream from the housing.

17. A method of filtering blood, which method comprises:

(a) passing the blood generally axially through a blood filter element which comprises a helically coiled strip of sheet material containing on at least one surface thereof a surface layer of a fibrous flocked material compatible with the blood to be filtered, and having a fiber length of less than about 5 mm, the sheet material wound into a helical coil of desired tightness to present a multitude of channels through the flocked material, the helically coiled strip being wound such that an increasing gradient in the tightness of the wind from the upstream to the downstream ends provides for both gradient and depth filtration of the blood; and

(b) recovering the blood so filtered.

23. A filter for a fluid stream, which filter comprises in combination:



(a) a filter housing adapted to contain a filter element and having an inlet at the one end for the introduction of a fluid stream to be filtered, and an outlet at the other end for the removal of the filtered stream; and

(b) a filter element which comprises

(i) a solid, flexible, helically coiled strip of sheet material,

(ii) a layer of adhesive material on at least one surface of the sheet material, and

(iii) fibrous particulate material adhesively secured to the adhesive layer to form a surface layer of the fibrous flocked material on the continuous surface, the filter element disposed in the housing as a helical coil of desired tightness to present a multitude of fibrous filter channels through the flocked material on the surface of the coil, the ends of the fibrous particulate material in contact with the adjacent surface of the sheet material or intermeshed with fibrous particulate material on said adjacent sheet material surface, the fibrous flocked material generally of uniform length and uniformly distributed on the surface of the sheet material, and which comprises fibers of not more than about 5 mm in length, the fibrous particulate material forming the flocked layer selected to remove particles from the stream to be filtered, the helical coil disposed to permit only axial flow of the fluid stream through the filter element as the stream passes from the inlet to the outlet of the housing.

35. A method of filtering blood to remove selected particles or biological constituents of the blood stream, which method comprises:

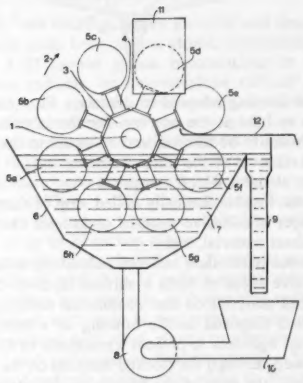
(a) passing the blood containing the particles to be removed, axially through a blood filter element which comprises
(i) a solid, flexible, helically coiled strip of sheet material,
(ii) a layer of adhesive material on at least one surface of the sheet material, and
(iii) fibrous particulate material adhesively secured to the adhesie layer to form a surface layer of the fibrous flocked material on the continuous surface, the fibrous flocked material compatible with the blood, the filter element disposed in the housing as a helical coil of desired tightness to present a multitude of fibrous filter channels through the flocked material on the surface of the coil, the ends of the fibrous particulate material in contact with the adjacent surface of the sheet material or intermeshed with fibrous particulate material on said adjacent sheet material surface, the fibrous flocked material generally of uniform length and uniformly distributed on the surface of the sheet material, and which comprises fibers of not more than about 5 mm in length, the fibrous particulate material forming the flocked layer selected to remove particles from the blood to be filtered, the helical coil disposed to permit only axial flow of the blood through the filter element as the blood passes from the inlet to the outlet of the housing; and
(b) recovering the blood so filtered.

4,092,247

METHOD AND APPARATUS FOR DEWATERING THICKENED SLUDGE

Rud Frik Madsen, Nakskov, Denmark, assignor to Aktieselskabet de Danske Sukkerfabrikker, Nakskov, Denmark

Filed Dec. 21, 1976, Ser. No. 753,100
Claims priority, application United Kingdom, Dec. 23, 1975, 52660/75
Int. Cl.² B01D *33/22*; C02C *1/18*
U.S. Cl. 210—67 **6 Claims**



1. A process for dewatering thickened sludge comprising the steps of:
(1) depositing thickened siudge onto a substantially flat, porous support of an intermittently rotating vacuum deposition means which comprises a plurality of such radially displaced supports,
(2) partially dewatering the thickened sludge by continuously establishing a vacuum within said porous support,
(3) intermittently compressing the partially dewatered sludge on said porous support at a pressure of from 1.0 to 10.0 kp/cm² to further dewater the sludge and to form a sludge cake,
(4) intermittently compressing said sludge cake on said porous support at a pressure of from 10.0 to 300.0 kp/cm² to further dewater the sludge cake amounts of liquid therefrom and
(5) intermittently discharging the dewatered sludge cake from said porous support.

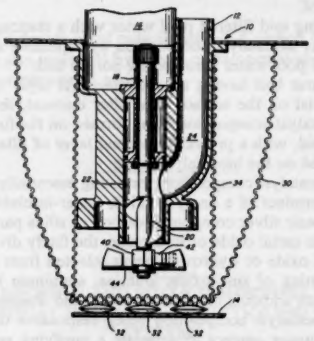
4. An apparatus for dewatering thickened sludge, comprising vacuum deposition means, including a plurality of radially displaced porous supports, means for depositing the thickened sludge onto said support, vacuum means connected to said support for establishing a vacuum therewithin for partially dewatering the thickened sludge, a pressure head zone means for pressing the partially dewatered sludge against said support at a pressure of from 1.0 to 10.0 kp/cm² to form a sludge cake and thereafter at a pressure of from 10.0 to 300.0 kp/cm² to further dewater the sludge cake, sludge cake removal means for removing the dewatered sludge cake from said support, and means to intermittently rotate said vacuum deposition means so as to intermittently pass each of said porous supports through each of said zone means.

4,092,248

PUMP-FILTER ASSEMBLY

Richard C. Lamb, Plantsville, Conn., assignor to Koehler-Dayton, Inc., New Britain, Conn.

Filed Jul. 18, 1977, Ser. No. 816,588
Int. Cl.² B01D *29/38*
U.S. Cl. 210—152 **3 Claims**



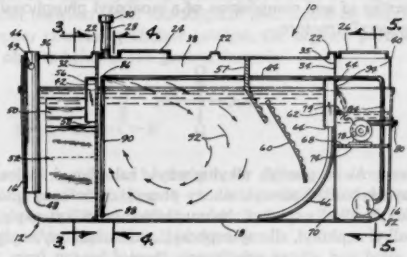
1. A pump-filter assembly for a recirculating toilet comprising
an axial flow pump including a support tube and a drive shaft supported therein,
means for rotating the drive shaft in first and second opposite directions,
a first impeller secured to said drive shaft, said impeller being selectively configured to pump when said drive shaft is rotated in the first direction and to forcefully draw in air when said drive shaft is rotated in the second direction,
said drive shaft extending below said support tube,
a second impeller supported on said drive shaft at a location below said support tube for free-wheeling rotation thereon,
a ratchet mechanism secured to the portion of said drive shaft extending below said support tube, and
a pawl mechanism secured to said second impeller means for selective driving engagement with said ratchet mechanism when said drive shaft is driven in the opposite second direction, and
filter means surrounding said axial flow pump.

4,092,249

SEWAGE TREATMENT DEVICE

Dominick La Gatta, Tempe, Ariz., assignor to Commanche Engineering Corp., Rockwell City, Iowa

Filed Jun. 21, 1976, Ser. No. 698,266
Int. Cl.[2] B01D *21/24*; C02C *1/08, 1/10*
U.S. Cl. 210—195 S 6 Claims



1. A sewage treatment device comprising:

an enclosed housing having opposite end walls, opposite side walls, a top wall and a bottom wall;

first and second upstanding partition walls each engaging said bottom wall and opposite side walls of said housing so as to divide said housing into first, second, and third serially connected compartments;

said first partition wall having a first opening located at a first predetermined height above said bottom wall and forming communication between said first and second compartments;

said second partition wall having a second opening located at a second predetermined height above said bottom wall and forming communication between said second and third compartments;

an inlet conduit forming communication from the exterior of said housing to the interior of said first compartment;

vent means in said top wall of said housing forming communication between said second compartment and the atmosphere whereby gases produced by sewage decomposition may escape and oxygen may enter said second compartment;

a recirculating pump having an inlet adjacent the bottom of said third compartment;

a recirculating conduit connected to said recirculating pump and extending into said second compartment adjacent said first partition wall;

upper and lower spray heads connected to said recirculating conduit adjacent said first partition wall, said upper spray head being positioned above said second predetermined height so as to spray effluent into the vented space within said second compartment above the fluid level therein, said lower spray head being positioned adjacent said bottom wall of said second compartment and adjacent said first partition whereby effluent exiting from said upper and lower spray heads will impart a circular agitation to said fluid in said second compartment and

a field pump within said third compartment for pumping fluid out of said third compartment to the exterior of said housing whenever fluid rises above a third predetermined level within said third compartment.

4,092,250

FILTERS FOR THE SELECTIVE COLLECTION OF METALLIC IONS

Takezo Sano, Takatsuki; Ichiki Murase, Ibaraki, both of Japan; Akira Kobayashi, deceased, late of Ibaraki, Japan; by Shuko Kobayashi, successor, and by Tsutomu Kobayashi, guardian, both of Kagoshima, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Aug. 9, 1976, Ser. No. 712,694
Claims priority, application Japan, Dec. 8, 1975, 50-98286
Int. Cl.[2] B01D *39/00, 39/14*
U.S. Cl. 210—500 M 5 Claims

1. A filter for the selective collection of metallic ions, comprising a water-permeable thin layer film made from synthetic pulp or synthetic fiber, which is pulp or fiber of a resin selected from the group consisting of polyethylene, polypropylene, polyvinyl chloride, polystyrene, polyvinyl alcohol, and novolac resins, having a concentration of metallic ion-collecting polar groups chemically linked thereto which contain an element selected from the group consisting of oxygen, nitrogen, and sulfur atoms and which selectively form a nonionic linkage together with metallic ions; said concentration being sufficient to provide said filter with a water permeability of 1 to 1000 seconds in terms of the time required for 1 cc of water to be filtered through the surface area of the film of 1 cm^2 under a water head of 10 cm,

said filter having been prepared by reacting said synthetic pulp or synthetic fiber with a metallic ion-collecting polar group providing compound under reaction conditions such that the metallic ion-collecting polar groups are chemically linked to said synthetic pulp or synthetic fiber.

4,092,251

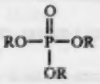
DURABLE FLAME RETARDANT FINISHES FOR TEXTILE MATERIALS

Ray E. Smith, Ann Arbor, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Feb. 23, 1976, Ser. No. 660,501
Int. Cl.[2] C09K *3/28*
U.S. Cl. 252—8.1 50 Claims

1. A flame retardant textile finish, said textile being cotton or a blend of cotton and polyester fibers, consisting essentially of:

(a) from about 16 percent to about 30 percent of a flame retardant compound of the formula



wherein each R is independently selected from halogenated aliphatic groups containing from 2 to about 6 carbon atoms and from 1 to about 3 halogen substituents per group;

(b) from about 3.2 percent to about 4.8 percent of a substantially water immiscible organic solvent characterized by having a flash point of at least 80° F. and a boiling point within the range of from about 300° to about 350° F.;

(c) from about 3.2 percent to about 4.8 percent of an emulsifying agent possessing a hydophile lipophile balance value of from about 10 to about 14;

(d) from about 27 percent to about 41 percent of a water soluble quaternary phosphonium salt selected from the group consisting of tetrakis(hydroxymethyl)phosphonium and tetrakis(methylhydroxymethyl) phosphium salts;

(e) from about 10 percent to about 15 percent of a water soluble organic nitrogen containing compound selected from the group consisting of urea, thiourea, guanidine and dicyandiamide

(f) from about 20 percent to about 31 percent of water.

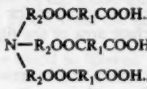
4,092,252

CONTROLLING CORROSION IN GAS-CONTAINING AQUEOUS DRILLING FLUID

Paul W. Fischer, Whittier, and David S. Pye, Brea, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed May 4, 1976, Ser. No. 683,092
Int. Cl.[2] C09K 7/02, 7/08
U.S. Cl. 252—8.5 A 16 Claims

1. A gas-containing clay free aqueous drilling fluid comprising about 99.5 to about 90 volume percent of a gas and about 0.5 to about 10 volume percent of an aqueous dispersion containing about 327 to about 347 pounds per barrel water, about 10 to about 2 pounds per barrel lignite, about 2.5 to about 5.0 pounds per barrel alkali metal or ammonium salt of a high molecular weight acrylic acid homopolymer or a copolymer of acrylic acid with up to 10 percent by weight of a monomer selected from the group consisting of acrylonitrile, methyl acrylate, ethyl acrylate and 2-methyl propanoic acid, said homopolymers and copolymers having an average molecular weight of 5,000 to 50,000, about 1.0 to about 0.05 pound per barrel of a polyamine salt having the formula:



wherein R_1 is a bivalent hydrocarbyl radical containing about 8 to about 44 carbon atoms, R_2 is an alkylene radical containing about 1 to about 4 carbon atoms, and A is a water-soluble amine or ammonia, an amount of an alkali metal hydroxide sufficient to raise the pH of the return stream of drilling fluid and produced fluids circulated out of the well during drilling operations to at least about 9, and about 1.0 to about 0.05 pound per barrel of ammonia.

4,092,253

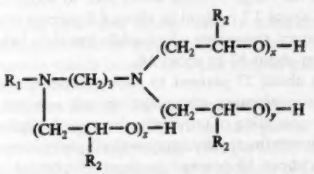
FABRIC SOFTENERS

Ulrich Cuntze; Adolf May, both of Hofheim, Taunus, and Hans-Walter Bucking, Kelkheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 31, 1976, Ser. No. 719,194
Claims priority, application Germany, Sep. 4, 1975, 2539270; Sep. 4, 1975, 2539310
Int. Cl.[2] D06M 13/20
U.S. Cl. 252—8.8 6 Claims

1. Aqueous softening composition consisting essentially of 1-35 weight % of a condensation product obtained from about 1 - 1.5 moles of a fatty acid or a fatty acid ester of the formula

wherein R is an aliphatic radical of about 11-21 carbons, and X is hydrogen, methyl or ethyl, with 1 mole of an alkylpropylenediaminoxalkylate of the formula



wherein R_1 is an aliphatic radical of 12-22 carbons, R_2 is hydrogen or methyl, x, y and z are 0 or 1, and the sum of x, y and z is 1-2.

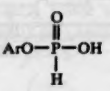
4,092,254

PROCESS OF PREPARING MONOARYL PHOSPHONATES AND LUBRICANT COMPOSITIONS CONTAINING SAME

Robert F. Bridger, Hopewell, and Kirk D. Schmitt, Pennington, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 26, 1976, Ser. No. 717,815
Int. Cl.[2] C10M 1/10
U.S. Cl. 252—49.8 5 Claims

1. A lubricant composition comprising a major amount of an oil of lubricating viscosity or a grease prepared therefrom containing a minor amount sufficient to improve the antiwear properties of said composition of a monoaryl phosphonate of the general structure:



wherein Ar is phenyl, alkyl phenyl, halophenyl, haloalkyl phenyl, ketoalkyl phenyl, alkoxy phenyl, carbalkoxy phenyl, naphthyl, alkyl naphthyl, halonaphthyl, haloalkyl naphthyl, ketoalkyl naphthyl, alkoxy naphthyl, and carbalkoxy naphthyl said alkyl and alkoxy substituents thereof having from 1 to about 30 carbon atoms.

4,092,255

NOVEL LUBRICATING COMPOSITIONS CONTAINING NITROGEN CONTAINING HYDROCARBON BACKBONE POLYMERIC ADDITIVES

Gilbert Chapelet, Bron; Hubert Knoche, Meyzieu, and Gilbert Marie, Pau, all of France, assignors to Entreprise de Recherches et d'Activites Petrolieres (E.R.A.P.), Paris, France

Filed Dec. 8, 1975, Ser. No. 638,521
Claims priority, application France, Dec. 12, 1974, 74 40947; Dec. 12, 1974, 74 40948
Int. Cl.[2] C10M 1/32
U.S. Cl. 252—50 18 Claims

1. Lubricating compositions comprising a major proportion of a lubricating oil and from about 0.2 to 10% by weight, based on the weight of said oil, of an oil-soluble polymer additive having a reduced viscosity, measured as a 0.1% solution in decalin at 135° C, between about 0.5 and 2, and a polydispersity less than 5 wherein said polymer additive is an olefinic copolymer containing, by weight, x % units of ethylene, y % units of mono-olefin having 3 to 6 carbon atoms or of a mono-olefin having 3 to 6 carbon atoms and a non conjugated diene, the proportion of units resulting from the diene being lower than or equal to 20%, and z % units of one or more nitrogeneous monomers selected from the group consisting of vinlimidazoles, vinylimidazolines, hydrocarbon substituted vinylimidazoles, hydrocarbon substituted vinylimidazolines, aminohydrocarbon substituted vinyl imidazoles, aminohydrocarbon substituted vinyl imidazolines, nitrogeneous heterocyclic monomers of formula R-B where R is a monovalent alkenyl radical having 2 to 12 carbon atoms, and B is a monovalent heterocyclic group obtained by loss of the hydrogen atom linked to the substitutable heteroatom of a heterocyclic compound selected from the group consisting of carbazole, hydrocarbon substituted carbazole, and aminohydrocarbon substituted carbazole, the values of x, y and z being such that $5<x<75$, $5<y<85$ and $0.1<z<20$ with the proviso that $x + y + z = 100$, said copolymer thereby improving the viscosity index (VI_E) of said oil and dispersing the slurry it may contain.

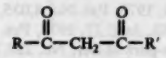
4,092,256

MAGNETIC COATING COMPOSITIONS

Keith S. Goodson, 14700 E. Hills Dr., San Jose, Calif. 95127, and Duncan W. Frew, 1200 Memorex Dr., Santa Clara, Calif. 95052

Filed Dec. 22, 1976, Ser. No. 753,537
Int. Cl.[2] H01F *1/28;* G11B *5/70;* C04B *35/00*
U.S. Cl. 252—62.54 12 Claims

1. A coating composition for use in the preparation of magnetic tapes comprising finely divided magnetic particles dispersed in an organic solvent containing in solution 2 to 10% by weight of a polyether urethane elastomer resin; 0.5 to 5% by weight of a hydroxy group containing polymer having an OH number between about 100–500; 0.01% to 0.06% by weight of a copper containing chelate catalyst, the organic portion of said chelate being of the general formula



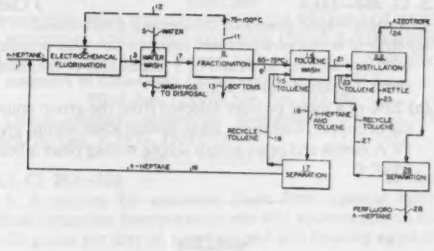
wherein R and R′ can be the same or different and represents alkyl groups containing 1–18 carbon atoms and aromatic groups, both substituted and unsubstituted; and 0.2 to 0.8% by weight of an aliphatic polyisocyanate.

4,092,257

CONSTANT BOILING ADMIXTURES OF TOLUENE/PERFLUORO-N-HEPTANE

George B. Fozzard, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 625,742, Oct. 24, 1975, Pat. No. 4,029,552. This application Feb. 4, 1977, Ser. No. 765,516
Int. Cl.[2] H01B *3/24;* C23G *5/02;* C11D *7/30*
U.S. Cl. 252—66 7 Claims



1. A substantially constant boiling mixture of (A) perfluoro-n-heptane and (B) toluene, characterized by a weight percent ratio of about 88.6–90.9 (A):11.4–9.1 (B) at substantially atmospheric pressure.

4,092,258

POWDER DETERGENT COMPOSITIONS

Robert L. McLaughlin, Wilmette, and Donald C. Wood, Des Plaines, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Aug. 21, 1975, Ser. No. 599,487
Int. Cl.[2] C11D *3/04, 7/56*
U.S. Cl. 252—99 20 Claims

1. A powder detergent composition adapted for machine dish washing using hard water and which does not require the presence of phosphates consisting essentially of the following components by weight:

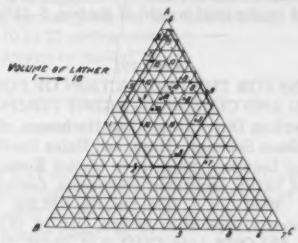
1. as the essential surfactant, from 2–8% of low foaming nonionic surfactant useful for machine dish washing,
2. from 0.5–5% of available chlorine or oxygen from a bleaching agent,
3. from 8–70% of ammonium sulfate, ammonium borate, ammonium carbonate, ammonium bicarbonate, or a mixture thereof,
4. from 0–50% of borax,
5. from 0-to about 1% of a sequestrant having an affinity for iron, and
6. any balance of said detergent consisting essentially of inert particulate filler which does not precipitate calcium or magnesium salts at use concentration, said composition providing a pH in the range of pH 7.0 - pH 8.5 when the composition is placed in 1% water solution.

4,092,259

QUICK LATHERING TOILET BARS AND METHOD OF MAKING SAME

Leon M. Prince, Westfield, N.J., assignor to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 419,558, Nov. 28, 1973, Pat. No. 3,989,647, which is a continuation of Ser. No. 137,288, Apr. 26, 1971, abandoned, which is a continuation-in-part of Ser. No. 54,008, Jul. 10, 1970, abandoned. This application Jun. 14, 1976, Ser. No. 695,710
Int. Cl.[2] C11D *10/04, 9/26, 9/32*
U.S. Cl. 252—117 8 Claims



1. A non-mushing high lathering synthetic toilet bar having a pH of about 4.5–9.5 and comprising based on the total weight of the actives:

i. 40 to about 85% of a primary alkane sulfonate or a mixture of alkane sulfonates wherein the carbon chain contains 12 carbon atoms or averages 12 carbon atoms;
ii. 5 to about 35% of a natural or synthetic fatty acid or mixtures thereof wherein the carbon chain contains or averages 12 carbon atoms;
iii. 5 to about 30% of a binder modifier selected from the group consisting of:
alkali metal, magnesium or ammonium salts of C_{12}–C_{16} mono-alkyl maleates and alkali metal,
magnesium or ammonium salts of C_{12}–C_{16} monoalkyl succinates; and
iv. based on the total weight of the bar, 5–25% water.

4,092,260

QUICK LATHERING TOILET BARS AND METHOD OF MAKING SAME

Leon M. Prince, Westfield, N.J., assignor to Lever Bros. Co., New York, N.Y.

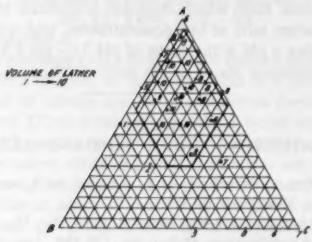
Division of Ser. No. 419,558, Nov. 28, 1973, Pat. No. 3,989,647, which is a continuation of Ser. No. 137,288, Apr. 26, 1971, abandoned, which is a continuation-in-part of Ser. No. 54,008, Jul. 10, 1970, abandoned. This application Jun. 14, 1976, Ser. No. 695,712
Int. Cl.[2] C11D *10/04, 9/26, 9/30, 9/32*
U.S. Cl. 252—117 8 Claims

1. A non-mushing high lathering synthetic toilet bar having a pH of about 4.5–9.5 and consisting essentially of based on the total weight of the actives:

(i) 40 to about 85% of a primary alkane sulfonate or a mix-

ture of alkane sulfonates wherein the carbon chain contains 12 carbon atoms or averages 12 carbon atoms;

(ii) 5 to about 35% of a natural or synthetic fatty acid or mixtures thereof wherein the carbon chain contains or averages 12 carbon atoms;



(iii) 5 to about 30% of a binder modifier selected from the group consisting of: alkali metal, magnesium or ammonium salts of C_{10}–C_{16} alkylmethyl taurides and alkali metal, magnesium or ammonium salts of C_{10}–C_{16} hydroxyalkylmethyl taurides; and

(iv) based on the total weight of the bar, 5–25% water.

4,092,261

PROCESS FOR THE PRODUCTION OF POWDERY WASHING AND CLEANSING AGENT COMPOSITIONS

Gerhard Sperling; Dieter Jung; Klaus Hachmann, all of Hilden; Milan Johann Schwuger, Haan, and Heinz Smolka, Langenfeld, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Germany

Filed Oct. 7, 1975, Ser. No. 620,386

Claims priority, application Austria, Oct. 10, 1974, 8150/74

Int. Cl.[2] C02B *1/44;* C11D *9/18, 11/00, 11/02*

U.S. Cl. 252—131 **8 Claims**

1. In a process for the production of powdery washing and cleansing agent compositions containing compounds capable of sequestering or binding calcium, said compositions consisting of (A) from 5 to 50% by weight of at least one finely-divided, water-insoluble silicate compound having a calcium binding power of 50 to 200 mg CaO/gm of anhydrous active substance, a particle size of from 0.01 μ to 30 μ and the formula on the anhydrous basis

$$(Na_2O)_x \cdot Al_2O_3 \cdot (SiO_2)_y$$

wherein x is a member from 0.7 to 1.1 and y is a number from 1.3 to 3.3, (B) from 5 to 25% by weight of nonionic surface-active compounds, (C) from 2.5 to 10% by weight of at least one alkali metal soap, at least some of which are soaps of fatty acids with 20 to 24 carbon atoms, and (D) from 15 to 60% by weight of at least one conventional ingredient of washing and cleansing compositions as follows: macromolecular organic soil-suspension agents, anionic surface-active compounds of the sulfonate and sulfate type, zwitterionic surface-active compounds, wash alkalis, sodium tripolyphosphate, organic builder salts capable of binding or precipitating calcium, foam stabilizers, non-soap foam inhibitors, textile fabric softeners, antimicrobial agents, optical brighteners, bleaching components, enzymes, perfumes and water, comprising the steps of preparing an aqueous slurry of said ingredients of said composition except those compounds sensitive to heat and moisture, spray-drying said aqueous slurry and recovering said powdery washing and cleansing composition, the improvement consisting essentially of preparing a first aqueous slurry having only sufficient water content to be pumpable and containing from 75 to 100% of the total amount of component (A), from 50 to 100% of the total amount of component (B), from 0.2 to 2% of component (C), where said alkali metal soap is an alkali metal salt of a fatty acid with 12 to 18 carbon atoms, and from 10 to 60% based on the weight of the dry components of said first aqueous slurry of component (D) except for said macromolecular organic soil suspension agents, and those compounds sensitive to heat and moisture, spray-drying said first aqueous slurry and combining the spray-dried powdery product with the remainder of said ingredients in powdery form, with the proviso that at least 60% of component (C) including all of said soaps of fatty acids with 20 to 24 carbon atoms is in said remainder of said ingredients in powdery form.

8. The powdery washing and cleansing agent compositions produced by the process of claim 1.

4,092,262

AZEOTROPIC COMPOSITIONS

Robert E. Reusser, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 609,115, Aug. 29, 1975, Pat. No. 4,035,258, which is a division of Ser. No. 391,663, Aug. 27, 1973, Pat. No. 3,936,387, which is a continuation-in-part of Ser. No. 223,779, Feb. 4, 1972, abandoned. This application Mar. 22, 1977, Ser. No. 780,194

Int. Cl.[2] C11D *7/50, 7/30;* C23G *5/02*

U.S. Cl. 252—171 **3 Claims**

1. The azeotrope which at substantially atmospheric pressure is characterized as about 90.4 weight per cent 1,2-dichloro-1,2-difluoroethane and about 9.6 weight per cent methanol.

4,092,263

METAL VAPOR GENERATOR

Peter D. Zavitsanos, Norristown, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Mar. 3, 1976, Ser. No. 663,500

Int. Cl.[2] H01J *7/20*

U.S. Cl. 252—181.4 **3 Claims**

1. A metal vapor generator comprising a mixture of:

(a) 80% of boron powders and titanium powders combined with one another in a ratio of 1 gram-atom of titanium to about 2 gram-atoms of boron; and

(b) 20% of a metal powder selected from the group consisting of copper, aluminum, alkali metals, alkali earths, group IV A metals and other metals whose boiling point is below 3500° C.

4,092,264

BARIUM OXIDE COATED ZIRCONIA PARTICLE FOR USE IN AN OXYGEN EXTRACTOR

Peter Hing-Shya Tsang, Southfield; Richard W. Hradek, Royal Oak, both of Mich., and James Daniel Bode, Davenport, Iowa, assignors to The Bendix Corporation, South Bend, Ind.

Filed Dec. 27, 1976, Ser. No. 754,466

Int. Cl.[2] A61L *13/00*

U.S. Cl. 252—186 **10 Claims**

1. A process of manufacturing an oxide material for use in an oxygen extractor, comprising the steps of:

mixing a quantity of dry zirconia particles with a quantity of barium peroxide particles to create a blended mixture;

heating said blended mixture in an oven to a temperature of between 500° to 600° C until said barium peroxide particles melt and coat the zirconia particles:

uniformly increasing the temperature in the oven up to 850° C causing said peroxide coating to decompose to a barium oxide coating;

cooling the barium oxide coated zirconia particles to room temperature; and

passing the cooled barium oxide coated zirconia particles through a grinder to produce a desired particle size for said oxide material.

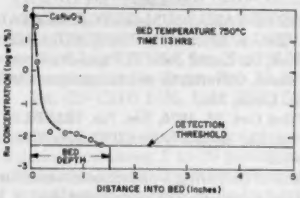
4,092,265

PROCESS FOR PREVENTING ECOLOGICAL CONTAMINATION DUE TO RADIOACTIVE RUTHENIUM, MOLYBDENUM OR TECHNETIUM

John M. Longo, New Providence, and Edward T. Maas, Jr., Kendall Park, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Sep. 28, 1976, Ser. No. 727,468
Int. Cl.[2] G21F *9/02*
U.S. Cl. 252—301.1 W 11 Claims

Figure I
Ru CONCENTATION PROFILE IN CaO BED



1. A process for the prevention of the escape of volatile radioactive oxides selected from the group consisting of oxides of ruthenium, molybdenum and technetium outside the reprocessing zone during the reprocessing of nuclear fuel comprising contacting the volatile radioactive oxides with a trapping agent selected from the group consisting of the oxides of calcium, strontium, barium, the lanthanides, lead and mixtures thereof, and the carbonates of calcium, strontium, barium, the lanthanides and mixtures thereof and mixtures of the oxides and carbonates of calcium, strontium, barium, lead and the lanthanides at a temperature sufficient to yield a nonvolatile ruthenate, molybdate or technetate.

4,092,266

PROCESS FOR REMOVING FOAM FROM AQUEOUS SYSTEMS AND COMPOSITION USEFUL THEREIN

Heinz Abel, and Alfred Berger, both of Reinach, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 7, 1976, Ser. No. 693,585
Claims priority, application Switzerland, Jun. 13, 1975, 7695/75; Oct. 7, 1975, 13011/75
Int. Cl.[2] B01D *19/04*
U.S. Cl. 252—321 28 Claims

1. A process for removing foam from aqueous systems which comprises incorporating into said aqueous system 0.001 to 20 grams per liter of a wetting and anti-foaming agent consisting essentially of

(1) 2 to 50 percent by weight of an anionic surfactant having the formula

$$R{-}A{-}(CH_2\underset{\displaystyle R_1}{\underset{|}{C}}HO)_m{-}X$$

wherein R is an aliphatic hydrocarbon radical of 8 to 22 carbon atoms or a cycloaliphatic or aliphatic-aromatic hydrocarbon radical of 10 to 22 carbon atoms,

R_1 is hydrogen or methyl,

$$A \text{ is } {-}O{-} \text{ or } {-}\overset{\displaystyle O}{\overset{\|}{C}}{-}O{-},$$

X is the acid radical of an inorganic acid which contains oxygen or the radical of a carboxylic acid, or alkali metal, ammonium or amine salts thereof, and

m is an integer from 1 to 20,

(2) 6 to 50 percent by weight of a water-insoluble aliphatic monoalcohol containing at least 8 carbon atoms, a reaction product of alkylene oxides and a water-insoluble aliphatic monoalcohol containing at least 8 carbon atoms, a reaction product of alkylene oxides and an alkylphenol, a reaction product of a saturated dicarboxylic acid of 3 to 10 carbon atoms and 1,2-propylene oxide or polypropylene glycols, a reaction product of a fatty acid containing 10 to 18 carbon atoms and 1,2-propylene oxide or polypropylene glycols, a reaction product of a fatty acid containing 10 to 18 carbon atoms, a trihydric to hexahydric alcohol and 1,2-propylene oxide, a reaction product of a fatty acid containing 10 to 18 carbon atoms, a polyalkylenepolyamine and 1,2-propylene oxide,

(3) 0.1 to 30 percent by weight of an organopolysiloxane silicone oil which is optionally terminally blocked with hydroxyl, and

(4) 2 to 92 percent by weight of water.

27. A wetting and antifoaming agent composition consisting essentially of

(1) 2 to 50 percent by weight of an anionic surfactant having the formula

$$R{-}A{-}(CH_2\underset{\displaystyle R_1}{\underset{|}{C}}HO)_m{-}X$$

wherein R is an aliphatic hydrocarbon radical of 8 to 22 carbon atoms or a cycloaliphatic or aliphatic-aromatic hydrocarbon radical of 10 to 22 carbon atoms,

R_1 is hydrogen or methyl

$$A \text{ is } {-}O{-} \text{ or } {-}\overset{\displaystyle O}{\overset{\|}{C}}{-}O{-},$$

X is the acid radical of an inorganic acid which contains oxygen or the radical of a carboxylic acid, or alkali metal, ammonium or amine salts thereof, and

m is an integer from 1 to 20,

(2) 6 to 50 percent by weight of

a water-insoluble aliphatic monoalcohol containing at least 8 carbon atoms, a reaction product of alkylene oxides and a water-insoluble aliphatic monoalcohol containing at least 8 carbon atoms, a reaction product of alkylene oxides and an alkylphenol, a reaction product of a saturated dicarboxylic acid of 3 to 10 carbon atoms and 1,2-propylene oxide or polypropylene glycols, a reaction product of a fatty acid containing 10 to 18 carbon atoms and 1,2-propylene oxide or polypropylene glycols, a reaction product of a fatty acid containing 10 to 18 carbon atoms, a trihydric to hexahydric alcohol and 1,2-propylene oxide, or

a reaction product of a fatty acid containing 10 to 18 carbon atoms, a polyalkylenepolyamine and 1,2-propylene oxide,

(3) 0.1 to 30 percent by weight of an organopolysiloxane silicone oil which is optionally terminally blocked with hydroxyl, and

(4) 2 to 92 percent by weight of water.

4,092,267

PROCESS FOR REGENERATING PALLADIUM CATALYSTS

Hans Fernholz, Fischbach, Taunus; Hans Krekeler, Bad Wiessee; Hans-Joachim Schmidt, Falkenstein, Taunus, and Friedrich Wunder, Florsheim (Main) all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed Mar. 23, 1976, Ser. No. 669,484
Claims priority, application Germany, Mar. 25, 1975, 2513125
Int. Cl.[2] B01J *23/96, 31/40;* C07C *67/05*
U.S. Cl. 252—413 9 Claims

1. A process for regenerating palladium carrier catalysts which have been utilized for the oxacylation of olefins in the gaseous phase and which contain no noble metal other than palladium, which comprises impregnating a body of the used palladium carrier catalyst containing 0.5 to 5% of palladium

and in solid form with a liquid mixture consisting essentially of 80 to 99.9% by weight of a first component which is a normally liquid fatty acid and 0.1 to 20% by weight of a second component selected from nitric oxides, nitric acid, peroxides, and per-acids, said liquid mixture being used in an amount such that it is substantially completely absorbed by the solid catalyst body, drying the catalyst at a temperature below 90° C. and evaporating the fatty acid to a residual content of below 8% by weight.

5. Process according to claim 1, wherein the drying step is carried out under reduced pressure.

6. Process according to claim 1, wherein the drying step is carried out in an inert gas stream.

8. A process according to claim 1, wherein said second component is a mixture of a nitric oxide and oxygen or an oxygen-containing gas.

9. A process according to claim 1, wherein the impregnating liquid mixture is used in an amount approximately equal to the pore volume of the catalyst.

4,092,268
CATALYTIC COMPOSITION

Yves de Zarauz, Le Cendre, France, assignor to Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie, Clermont-Ferrand, France

Division of Ser. No. 582,120, May 30, 1975, Pat. No. 3,886,661. This application Feb. 23, 1976, Ser. No. 660,695

Claims priority, application France, Jun. 5, 1974, 74 19475

Int. Cl.[2] B01J *31/12, 31/02*

U.S. Cl. 252—430 **6 Claims**

1. A catalytic composition for the polymerization and copolymerization of olefins consisting of

a. a lithium initiator selected from the group consisting of metallic lithium, ethyl-lithium, n-butyl lithium, isobutyl-lithium, sec.-butyl-lithium, ter.-butyl-lithium, isopropyl-lithium, n-amyl-lithium, isoamyl-lithium, allyl-lithium, propenyl-lithium, isobutenyl-lithium, polybutadienyl-lithium, polyisoprenyl-lithium, polystyryl-lithium, 1, 4-dilithium butane, 1-5-dilithium pentane, 1, 20-dilithium eicosane, benzyl-lithium, phenyl-lithium, 1, 1-diphenyl-methyl-lithium, the polylithium reaction product of metallic lithium with 1, 1-diphenylethylene, the polylithium reaction product of metallic lithium with trans-stilbene, the polylithium reaction product of metallic lithium with tetraphenylethylene, lithium-naphthalene, lithiumanthracene, lithium-chrysene and lithiumdiphenyl; and

b. a cocatalyst system consisting of (b_1) a compound of barium or strontium selected from the group consisting of barium hydride, strontium hydride, barium naphthenate, barium methanolate, strontium methanolate, barium ethanolate, strontium ethanolate, barium tertio-butanolate, barium nonylphenate, barium acetylacetonate, strontium acetylacetonate, barium dibenzoylmethane, strontium dibenzoylmethane, barium thenoyltrifluoroacetonate, strontium thenoyltrifluoro-acetonate, barium benzoyltrifluoro-acetonate, strontium benzolytrifluoro-acetonate, barium benzoyl-acetonate, strontium benzoyl-acetonate, barium 1, 1-diphenylethylene, strontium 1, 1-diphenylethylene, barium 1, 2-acenaphthylene, strontium 1, 2-acenaphthylene, barium tetraphenyl-butane, strontium tetraphenylbutane, barium alpha-methyl-styrene, strontium alpha-methyl-styrene, diphenyl-barium, diphenylstrontium, bis-cyclopentadienyl-barium, bis-cyclopentadienyl-strontium, barium triphenylsilyl, strontium triphenylsilyl, phenyl-barium iodide, methyl-strontium iodide, barium-benzophenone, strontium-benzophenone, barium-cinnamone, strontium-cinnamone, barium-naphthalene, strontium-naphthalene, barium-anthracene, strontium-anthracene, barium-chrysene and strontium-chrysene; and (b_2) an organometallic compound of aluminum or zinc selected from the group consisting of diethyl zinc, triethyl aluminum, tri-isobutyl aluminum, diethyl aluminum chloride, ethyl aluminum dichloride, ethyl aluminum sesquichloride, methyl aluminum sesquichloride, diethyl aluminum hydride and diisobutyl aluminum hydride;

said components being present in such quantities that the ratios are within the following limits:

$$0.2 \leqq \frac{\text{mole of organometallic compound of Al or Zn}}{\text{mole of compound of Ba or Sr}} \leqq 10$$

with

$$0.25 \leqq \frac{\text{mole of compound of Ba or Sr}}{\text{gram atom of Li}} \leqq 5$$

4,092,269
PHOSPHORUS-VANADIUM-OXYGEN CATALYSTS HAVING A SPECIFIC PORE VOLUME

Ramon A. Mount, St. Louis; John F. Pysz, Jr., Crestwood, and Harold Raffelson, Olivette, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 15, 1976, Ser. No. 732,555

Int. Cl.[2] B01J *27/14;* C07D *307/60*

U.S. Cl. 252—435 **5 Claims**

1. In a method of preparing a phosphorus-vanadium-oxygen catalyst wherein a phosphorus compound and a vanadium compound are brought together under conditions to provide a catalyst precursor having a phosphorus to vanadium atom ratio between about 0.5:1 and 2:1, and calcining the precursor at a temperature between about 300° and 600° C., the improvement which comprises adding to the precursor a sufficient amount of a pore modification agent selected from the group consisting of polymeric materials, cellulosic materials, monosaccharides, polysaccharides, hydrogenated vegetable oils and mixtures thereof to provide a catalyst wherein the pore volume from pores having diameters between about 0.8 micron and about 10 microns is greater than 0.02 cc/g.

4,092,270
CATALYST FOR THE PRODUCTION OF 2,2-DISUBSTITUTED PROPIOLACTONES

Jerry D. Holmes, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 648,080, Jan. 12, 1976, Pat. No. 4,035,389, which is a continuation-in-part of Ser. No. 609,881, Sep. 2, 1975, Pat. No. 4,024,080, which is a division of Ser. No. 491,092, Jul. 23, 1974, Pat. No. 3,931,237, which is a continuation-in-part of Ser. No. 394,370, Sep. 4, 1973, abandoned. This application Apr. 25, 1977, Ser. No. 790,640

Int. Cl.[2] B01J *29/08, 29/16;* B01D *15/06*

U.S. Cl. 252—454 **15 Claims**

1. A catalyst consisting of the acid treated metal oxide-silica gel complex which results from (1) heating the calcined residue of a mixture of silica gel and a water soluble salt of a metal selected from the group consisting of tantalum, titanium, niobium and zirconium to a temperature of from about 650° C. to about 1000° C. in the presence of water vapor and (2) soaking the product of step (1) in a mineral acid.

11. A process of restoring activity to a metal oxide-silica gel complex catalyst, which has lost activity as a result of use, which consists of the steps of removing any carbonaceous deposit which may be present and soaking the said carbon-free catalyst in a mineral acid.

4,092,271
SUPPORTED VANADIA CATALYST FOR NITRILE PRODUCTION AND PROCESS FOR PREPARING THE CATALYST

Morgan C. Sze, Upper Montclair, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Continuation-in-part of Ser. No. 727,060, Sep. 27, 1976, abandoned. This application Jul. 28, 1977, Ser. No. 819,771

Int. Cl.[2] B01J *21/04, 21/08, 23/04, 23/22*

U.S. Cl. 252—455 R **32 Claims**

1. In a catalyst of vanadia supported on a porous support in

an amount to provide a vanadia to support weight ratio ranging from about 0.3:1 to about 3:1 substantially entirely within the pores of the support, said vanadia having been placed in molten form substantially within the pores of the support having a surface area greater than about $50m^2$/gram, a porosity greater than about 0.4 cc/gram, the improvement comprising: said catalyst containing an alkali metal in an amount to provide a vanadium metal to alkali metal mole ratio of from 2:1 to 30:1.

4,092,272

LIQUID DETERGENT COMPOSITION

Masaaki Nishimura, Sakura, and Haruhiko Arai, Narashino, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Aug. 12, 1976, Ser. No. 713,781
Claims priority, application Japan, Sep. 16, 1975, 50-111034
Int. Cl.² C11D 3/26, 3/34, 7/32, 7/34
U.S. Cl. 252—545 **3 Claims**

1. A liquid detergent composition consisting essentially of an aqueous solution containing 5 to 30 percent by weight of a mixture of polyoxyethylene alkyl ether sulfate salts which was prepared by adducting ethylene oxide to a starting alcohol, distilling the resulting adduct reaction product to remove unreacted alcohol and adduct compounds having 3 or more moles of adducted ethylene oxide, then esterifying the remaining adduct reaction product with sulfuric acid, and then neutralizing the esterified adduct reaction product to obtain said mixture of polyoxyethylene alkyl ether sulfates having the formula

$$RO(CH_2CH_2O)_nSO_3M$$

wherein R is alkyl having from 8 to 18 carbon atoms and the average carbon atom number of R for the mixture is from 10 to 15, the average value of *n* for the mixture is from 1.0 to 2.6 with the proviso that the content of salts in which (1) *n* is zero is less than 5 percent by weight, (2) *n* is 3 or more is less than 18 percent by weight and (3) *n* is one or 2 is more than 77 percent by weight, all percentages being based on the total weight of said mixture, and M is alkali metal, alkaline earth metal, ammonium or alkanol amine, and the balance is essentially water.

4,092,273

LIQUID DETERGENT OF CONTROLLED VISCOSITY

Jack T. Inamorato, Westfield, and William Chirash, New Providence, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 511,760, Oct. 3, 1974, abandoned. This application Jan. 24, 1977, Ser. No. 762,218
Int. Cl.² C11D 1/66
U.S. Cl. 252—548 **9 Claims**

1. A liquid detergent having a viscosity in the range of 40 to 100 centipoises at 24° C. and which is fluid at 7° C. which consists essentially of, by weight, from 10 to 60% of a water-soluble C_2–C_3 alkoxylated C_{10}–C_{18} alkanol nonionic detergent, 4 to 12% of a C_2–C_3 alkanol, 1 to 6% of water-soluble salts of dibasic acids of the formula $(CH_2)_n(COOH)_2$, wherein *n* is 3 to 5 as a viscosity control and gel prevention agent, and 22 to 84.5% of water.

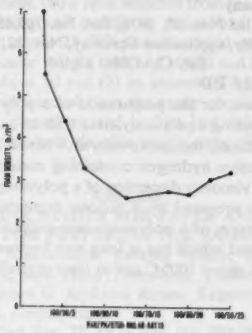
4,092,274

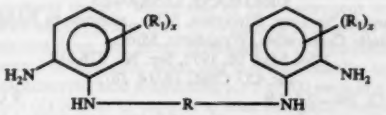
POLYMERIC FOAMS FROM CROSS-LINKABLE POLY-N-ARY LENEBENZIMIDAZOLES

James C. Fletcher, Administrator of the National Aeronautics & Space Administration with respect to an invention of; Edward S. Harrison, San Diego; Chadwick B. Delano, Sunnyvale, and Salvatore R. Riccitiello, San Jose, all of Calif.

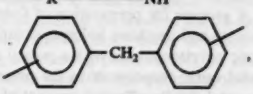
Filed Jul. 26, 1976, Ser. No. 708,951
Int. Cl.² C08V 9/02
U.S. Cl. 260—2.5 N **6 Claims**

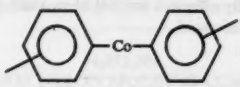
1. A poly-N-arylene benzimidazole foam having a density within the range of 1.5 to 10 lb/ft^3, comprising the condensation product of an ortho substituted aromatic dicarboxylic acid anhydride, an aromatic tetracarboxylic acid dianhydride and an organic tetramine selected from the group consisting of

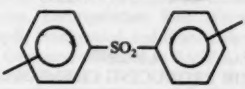


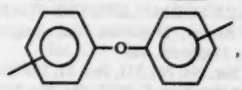


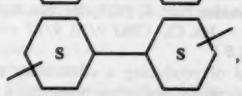
wherein R is C_{6-12} arylene,

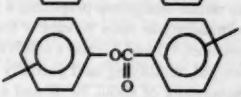


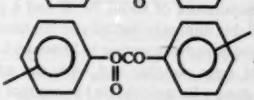




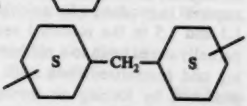








or



4,092,275

POLYURETHANE RESINS PREPARED FROM ACTIVE HYDROGEN CONTAINING MATERIAL WHICH IS A DISPERSION OF POLYISOCYANATE-POLYADDITION PRODUCTS IN HYDROXYL CONTAINING COMPOUNDS AS DISPERSING AGENTS

Artur Reischl, Leverkusen; Gert Jabs; Werner Dietrich, both of Cologne, and Alberto Carlos Gonzalez-Dorner, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 10, 1976, Ser. No. 740,455
Claims priority, application Germany, Nov. 12, 1975, 2550860
Int. Cl.[2] C08G *18/14*
U.S. Cl. 260—2.5 BD 5 Claims

1. In a process for the preparation of a polyurethane resin comprising reacting a polyisocyanate with an active hydrogen containing material, the improvement wherein at least a portion of said active hydrogen containing material is a stable, relatively low viscosity dispersion of a polyisocyanate-polyaddition product prepared by a process comprising mixing an aqueous dispersion of a polyisocyanate-polyaddition product with a compound which has at least two hydroxyl groups and a boiling point above 100° C and at least partially distilling off the water.

4,092,276

PROCESS FOR THE PREPARATION OF FOAMS CHARACTERIZED BY ISOCYANURATE AND URETHANE LINKAGES

Thirumurti Narayan, Riverview, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Mar. 10, 1977, Ser. No. 776,218
Int. Cl.[2] C08G *18/14, 18/22*
U.S. Cl. 260—2.5 AB 9 Claims

1. A process for preparation of foams characterized by isocyanurate and urethane linkages comprising condensing (a) an organic polyisocyanate with a polyol or (b) an isocyanate-terminated quasi-prepolymer in the presence of a blowing agent and a catalytically effective amount of an alkali metal salt of an organic phosphinic acid.

4,092,277

METHOD FOR PRODUCING CHEMICALLY STABLE UREA-FORMALDEHYDE FOAMS

William Percy Moore, Hopewell, Va., assignor to Waverly Chemical Co., Hopewell, Va.

Continuation of Ser. No. 761,321, Jan. 21, 1977, abandoned. This application Nov. 7, 1977, Ser. No. 849,109
Int. Cl.[2] C08J *9/30, 9/12*
U.S. Cl. 260—2.5 F 3 Claims

1. A method of producing a chemically stable urea-formaldehyde foam which comprises preparing a partially cured aqueous urea-formaldehyde resin having a formaldehyde to urea mol ratio between 1.5 and 2.0 and a solids content of 40 to 65 percent by weight, modifying said partially cured resin by reaction at a temperature of about 50° C and a pH of about 5 with a water soluble aliphatic dialdehyde containing between 2 to 4 skeletal carbons and amounting to between 1 and 5 percent of the modified resin weight, and with the additional urea required to produce a formaldehyde to urea mol ratio between 1.3 and 1.5 in the modified resin, neutralizing the modified partially cured resin to a pH between 7.0 and 8.5, and combining said neutralized resin with foamed cured agent solution produced by forcing air through a dilute aqueous solution containing about 1 percent water soluble acid and a surfactant.

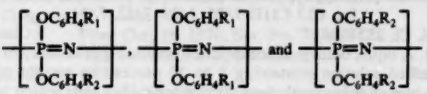
4,092,278

MOLECULAR-WEIGHT MODIFICATION OF POLYPHOSPHAZENES

Ronald L. Dieck; Louis Goldfarb, and Nancy D. Hann, all of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Jun. 11, 1976, Ser. No. 694,978
Int. Cl.[2] C08J *9/10*
U.S. Cl. 260—2.5 R 7 Claims

1. The process of foaming an aryloxy polyphosphazene polymer prepared by the process comprising thermally treating poly(aryloxyphosphazene) polymers in which the phosphorus atom of the backbone contains substituted aryloxy substituents on the phosphorus atom having randomly distributed repeating units represented by the formulas:



wherein R_1 and R_2 are the same or different and are hydrogen, C_1–C_{10} linear or branched alkyl or C_1–C_4 linear or branched alkoxy, wherein when R_1 and R_2 are different, $(OC_6H_4—R_1)$-:$(OC_6H_4—R_2)$ is from about 1:6 to about 6:1, said thermal treatment carried out at 100°–300° C. in an inert atmosphere, the weight average molecular weight of said thermally treated polymers from 1×10^6 to 1×10^5, which comprises mixing the said copolymers with a chemical blowing agent and a mixture of curing agents, at least one of said curing agents having an initiation temperature below the temperature at which the chemical blowing agent decomposes; heating the mixture to a temperature below the decomposition temperature of said blowing agent, but above the initiation temperature of at least one of said curing agents for a time sufficient to partially precure the copolymer; and heating the partially pre-cured mixture to a temperature from above the decomposition temperature of said blowing agent to foam the copolymer and effect a further cure thereof.

4,092,279

COATING FOR RUBBER ARTICLES

Charles Piskoti, Adrian, Mich., assignor to SWS Silicones Corporation, Adrian, Mich.

Filed Apr. 12, 1976, Ser. No. 675,665
Int. Cl.[2] C08L *89/00*
U.S. Cl. 260—8 13 Claims

1. A composition for treating the outer surface of rubber articles prior to vulcanization which comprises a mixture consisting essentially of (A) from 2 to 80 percent by weight based on the weight of the mixture of a preformed latex binder selected from the class consisting of natural rubber and synthetic polymers obtained from the in-situ polymerization of emulsified monomers, said synthetic polymers are selected from the class consisting of homopolymers of conjugated dienes, copolymers of the conjugated dienes and copolymers of the conjugated dienes and monomers having monoethylenic unsaturation selected from the class consisting of styrene, substituted styrenes, acrylic and methacrylic acids, esters, nitriles and amides thereof and vinyl pyridine, (B) from 1 to 20 percent by weight of the mixture of an emulsifying agent selected from the class consisting of anionic and nonionic emulsifying agents, (C) from 1 to 80 percent by weight based on the weight of the mixture of a filler selected from the class consisting of graphite, carbon black, mineral fillers and mixtures thereof, (D) from 0.1 to 10 percent by weight based on the weight of the mixture of a thickening agent selected from the class consisting of bentonite, starch, synthetic gums and water soluble cellulose derivatives, (E) from 0.05 to 10 percent by weight based on the weight of the mixture of caesin in the form of a protective colloid and sufficient water to provide a composition having a

solids concentration of from 2 to 70 percent by weight based on the weight of the mixture and water.

4,092,280

COMPOSITION FOR A TYPEWRITER RIBBON HAVING DELAYED ALTERATION RESISTANCE

Victor Barouh, 111 Wheatley Rd., Old Westbury, N.Y. 11568; George Rottmann, 8 Valentine Hill, Sparkell, N.Y. 10976, and Sylvester Giaccone, 99-05 59th Ave., Flushing, N.Y. 11368

Filed Mar. 26, 1976, Ser. No. 670,784
Int. Cl.[2] C08K 5/00; C09D 11/10
U.S. Cl. 260—23 XA 3 Claims

1. A delayed alteration resistance ink composition consisting substantially of approximately 8.75 parts polyamide resin, 12.00 parts dioctyl phthalate, 30.25 parts isopropanol, 15.00 parts toluol, 3.00 parts toner, 4.00 parts pigment, 2.25 parts non-ferrous tannic acid, 6 parts hydrogenated terphenyl, and 1.5 parts peltrolatum, and 1 part water-soluble hiphenylmethane dye which is capable of migrating gradually into typing bond after the delayed alteration resistance ink composition has been placed in contact therewith, and which triphenylmethane dye has no solubility in any of the liquid components of said delayed alteration resistance ink composition.

2. A delayed alteration resistance ink composition consisting substantially of approximately 8 parts polyamide resin, 17 parts hydrogenated terphenyl, 22 parts toluol, 22 parts isopropanol, 9 parts pigment, and 1 part watersoluble hyphenylmethane dye which is capable of migrating gradually into typing bond after the delayed alteration resistance ink composition has been placed in contact therewith, and which triphenylmethane dye has no solubility in any of the liquid components of said delayed alteration resistance ink composition.

3. A delayed alteration resistance ink composition consisting substantially of approximately 52 parts methyl ethyl ketone, 6 parts tricresyl phosphate, 6 parts vinyl acetate-vinyl chloride copolymer resin, 13 parts oleic acid, 15 parts pigment, and 1 part water-soluble triphenylmethane dye which is capable of migrating gradually into typing bond after the delayed alteration resistance ink composition has been placed in contact therewith, and which triphenylmethane dye has no solubility in any of the liquid components of said delayed alteration resistance ink composition.

4,092,281

FIRE RETARDANT POLYSTYRENIC COMPOSITIONS

Jean-Noel Marie Bertrand, Tervueren, Belgium, assignor to Labofina S. A., Brussels, Belgium

Filed Jul. 9, 1975, Ser. No. 594,219
Claims priority, application Belgium, Jul. 12, 1974, 146536
Int. Cl.[2] C08K 5/03, 5/20
U.S. Cl. 260—23 H 21 Claims

1. A self-extinguishing polystyrenic composition, comprising:

a. a polystyrenic polymer;

b. a fire retardant amount of a halogenated organic fire-retardant agent selected from the group consisting of polyhalogenated biphenyls, polyhalogenated biphenylethers, perhalopentacyclododecane, and tris (2,3-dibromopropyl)phosphate; and

c. an antistatic agent selected from the group consisting of lauric diethanolamide, ethoxylated cetylamine, pelargonic acid triisopropanolamide, lauric monoisopropanol amide, N-(3-dodecyloxy-2-hydroxypropyl)ethanolamine, and (3-laurylamidopropyl)-trimethylammonium methyl sulfate in an amount sufficient to enhance the self-extinguishing properties of said composition.

4,092,282

HOT MELT SEALANT COMPOSITION

John E. Callan, Broken Arrow, Okla., assignor to Cities Service Company, Tulsa, Okla.

Continuation-in-part of Ser. No. 689,024, May 24, 1976, abandoned. This application Aug. 19, 1977, Ser. No. 825,889
Int. Cl.[2] C08L 77/00
U.S. Cl. 260—26 4 Claims

1. A hot melt sealant composition comprising (A) a butyl rubber component, (B) a resin selected from the group consisting of plasticizing and tackifying resins, and (C) a reacted mixture of (1) about 25–100 phr of a solid polyamide resin having a molecular weight less than 10,000 and an amine value greater than about 50 and (2) an amount of an alkaline earth metal hydroxide selected from the group consisting of magnesium, calcium, strontium, and barium hydroxides such as to provide a polyamide/hydroxide weight ratio of about 10-20/1.

4,092,283

GRAVURE INK BINDER FOR PAPER AND PROCESS FOR PREPARING THE SAME

Toshio Oishi, Nishinomiya; Takashi Kitano, Osaka; Hiroshi Sasaki, Nara, and Tetuo Yamashita, Tondabayashi, all of Japan, assignors to Arakawa Rinsan Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 23, 1975, Ser. No. 589,087
Claims priority, application Japan, Jun. 25, 1974, 49-73043
Int. Cl.[2] C08L 93/00
U.S. Cl. 260—27 BB 19 Claims

1. A gravure ink binder for paper comprising the reaction product of (a) at least one member selected from the group consisting of cyclopentadiene, dicyclopentadiene and substitution products thereof where one or two hydrogens are replaced by methyl group, (b) 1 to 30 parts of at least one member selected from the group consisting of α,β-ethylenically unsaturated dicarboxylic acids and α,β-ethylenically unsaturated dicarboxylic acid anhydrides, (c) 5 to 100 parts of a resin acid, and (d) 0.05 to 11 parts of at least one metal compound selected from the group consisting of bivalent metal oxides, bivalent metal hydroxides and bivalent metal acetates, said reaction product having a softening point of 150° to 220° C. and an acid value of not more than 100, and said parts of (b), (c) and (d) being parts by weight per 100 parts of (a).

4,092,284

FLAMEPROOF NYLON MOLDING COMPOSITIONS

Rainer Theysohn, Ludwigshafen; Rolf Wurmb, Heidelberg; Wolfgang Seydl, Frankenthal, and Franz Zahradnik, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Oct. 12, 1976, Ser. No. 731,126
Claims priority, application Germany, Nov. 18, 1975, 2551718
Int. Cl.[2] C08L 91/00
U.S. Cl. 260—28 R 3 Claims

1. A flameproofed thermoplastic molding composition which comprises

(a) a thermoplastic nylon,

(b) red phosphorus and

(c) talc as a filler, wherein said molding composition contains from about 0.5 to 12% by weight of red phosphorus and from about 10 to 50% by weight of filler, the amounts by weight being based on the total molding composition.

4,092,285

ENCAPSULATION OF CRITICAL CHEMICALS

Thomas J. Leo, Yardley, and Michael J. Reynolds, Morrisville, both of Pa., assignors to Wyrough and Loser, Inc., Trenton, N.J.

Filed Jul. 30, 1976, Ser. No. 710,115
Int. Cl.[2] C08L 91/00
U.S. Cl. 260—28.5 R 93 Claims

19. A composition of matter useful for rapidly and homoge-

neously dispersing a critical chemical in a rubber or plastic compound, said composition comprising from about 60 to about 95 percent by weight of a critical chemical and from about 5 to about 40 percent by weight of a binder, said binder comprising a wax having a sharp melting point in the range of about 55°–80° C, and a polymer having a molecular weight of at lest about 50,000 which when combined with the other binder component produces a binder which is a non-tacky gel below about 53° C. and returns to a liquid above about 53° C.

4,092,286

PRODUCTION OF WATER-DISPERSIBLE POLYURETHANES HAVING IONIC GROUPS AND HYDROPHILIC SIDE CHAINS

Klaus Noll, Cologne; Jürgen Grammel, Dormagen, and Walter Meckel, Neuss, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 15, 1976, Ser. No. 741,818

Claims priority, application Germany, Nov. 14, 1975, 2551094

Int. Cl.² C08L *75/08*; C08G *18/17*

U.S. Cl. 260—29.2 TN **16 Claims**

1. Water-dispersible polyurethanes having a substantially linear molecular structure, characterized by:

(a) lateral polyalkylene oxide polyether chains having a content of laterally incorporated ethylene oxide units sufficient to provided from about 0.5 to 10%, of the weight of the polyurethane as a whole, and,

(b) a content of $=N^{\oplus}=$, $-COO^{\ominus}$ or $-SO_3^{\ominus}$ groups of from about 0.1 to 15 milliequivalents per 100 g.

4,092,287

PROCESS FOR PRODUCING STABLE EMULSION OF POLYMER

Shojiro Ito, Niihama; Toshiyuki Kobashi, Okayama; Yasuhiro Kitagawa, Okayama, and Katsumi Kunikata, Okayama, all of Japan, assignors to Japan Exlan Company, Limited and Sumitomo Chemical Company, Limited, both of Osaka, Japan

Filed Oct. 1, 1976, Ser. No. 728,881

Claims priority, application Japan, Oct. 3, 1975, 50-120017

Int. Cl.² C08L *33/02*

U.S. Cl. 260—29.6 RB **8 Claims**

1. A process for the production of a stable polymer emulsion which comprises polymerizing a radical-polymerizable monomer having an unsaturated bond in the presence of a water-soluble polymer containing monomer units consisting essentially of an ethylenically unsaturated carboxylic acid or a salt thereof selected from the group consisting of acrylic acid, methacrylic acid and salts thereof; an ethylenically unsaturated sulfonic acid or a salt thereof and an anionic surface active agent in an aqueous medium at a pH not higher than 4, using a water-soluble catalyst, said water-soluble polymer being used in an amount of 0.1–10% by weight of the radical-polymerizable monomer; the weight ratio of the units of carboxylic acid or its salt to the units of the sulfonic acid or its salt in the polymer is 30–80/70–20 and wherein the anionic surface active agent is used in an amount of 0.1–1.5% by weight of said radical-polymerizable monomer.

4,092,288

STABILIZED POLYCARBONATE RESIN

Thornton Ross Calkins, Pittsfield, Mass., and Donald Benjamin George Jaquiss, New Harmony, Ind., assignors to General Electric Company, Pittsfield, Mass.

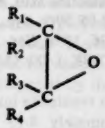
Continuation of Ser. No. 520,659, Nov. 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 320,638, Jan. 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 103,870, Jan. 1, 1971, abandoned. This application Jul. 22, 1976, Ser. No. 707,619

Int. Cl.² C08L *69/00*

U.S. Cl. 260—37 PC **4 Claims**

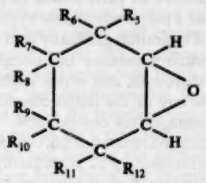
1. A thermally stable aromatic polycarbonate composition comprising an aromatic polycarbonate resin having in admixture therewith an additive selected from the group consisting of (a) 0.005–0.5 weight percent of a phosphine and (b) a mixture of 0.005–0.5 weight percent of a phosphine and 0.01 to about 1.0 weight percent of an epoxy compound; said phosphine being selected from the group consisting of triaryl, trialkyl, tri(alkylaryl) and alkyl-aryl phosphines and mixtures thereof and said epoxy compound being selected from the group consisting of compounds represented by the formulae:

I. Derivatives of epoxy ethane represented by the following formula:



wherein R_1, R_2, R_3 and R_4 are independently selected from the group consisting of hydrogen, an alkyl radical of 1–24 carbon atoms, an aryl radical of 6–24 carbon atoms, $—CH_2OR'$, $—CH_2OCOR'$, $—CH_2OCOR''COOCH_2X$, $CH_2OR'OCH_2X$ wherein R' is selected from the group consisting of an alkyl radical of 1–24 carbon atoms or an aryl radical of 6 to 24 carbon atoms and wherein R'' is an alkylene radical of 1–24 carbon atoms and X is an oxirane ring.

II. Derivatives of epoxy cyclohexane represented by the following formula:



wherein R_5 through R_{12} are independently selected from the group consisting of hydrogen, alkyl radicals of 1–24 carbon atoms, $—COOR_{13}$, $—OCOR_{13}$, $—COOR_{14}X$, $—OCOR_{14}$ —COOX wherein R_{13} is an alkyl radical of 1–24 carbon atoms and R_{14} therein is an alkylene radical of 1–24 carbon atoms and X is an oxirane ring; provided that the number of hydrogen atoms in said epoxy compounds should be such as to minimize the volatility of the epoxy compound.

4,092,289

POLYESTER COMPOSITION

Timothy Alan Remmington, Hertford, England, assignor to Imperial Chemical Industries Limited, United Kingdom

Continuation-in-part of Ser. No. 487,761 Jul. 11, 1974, abandoned. This application Sep. 7, 1976, Ser. No. 720,665

Claims priority, application United Kingdom, Jul. 25, 1973, 35364/73

Int. Cl.² C08K *3/22, 3/36*

U.S. Cl. 260—40 R **12 Claims**

1. A linear polyester composition which contains 0.01 to 10% by weight of the total composition of an inert particulate additive comprising a mixture of particulate pyrogenic silica and particulate pyrogenic alumina, each of the particulate materials having a mean primary particle size of up to 100 millimicrons.

4,092,290

IN SITU CURABLE SEALANT AND METHODS FOR MAKING AND USING SAME

George H. Bowser, New Kensington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 371,913, Jun. 20, 1973, abandoned, which is a continuation-in-part of Ser. No. 190,864, Oct. 20, 1971, abandoned, which is a division of Ser. No. 49,779, Jun. 25, 1970, abandoned. This application May 30, 1975, Ser. No. 582,494

Int. Cl.[2] C08L 23/22

U.S. Cl. 260—42.36 24 Claims

1. A room temperature vulcanizable sealant comprising an essentially solvent-free admixture of two rubbery components said admixture having an initial consistency of 100 to 300 metergrams and comprising:

a. as a first component:
   i. 18 to 35 percent by weight butyl rubber;
   ii. 8 to 20 percent by weight polyisobutylene;
   iii. 15 to 35 percent by weight polybutene;
   iv. 0.2 to 2 percent by weight quinone dioxime; and
   v. at least 3 percent by weight pigment or filler or a combination of pigment and filler;

b. as a second component:
   i. 18 to 35 percent by weight butyl rubber;
   ii. 8 to 20 percent by weight polyisobutylene;
   iii. 15 to 35 percent by weight polybutene;
   iv. 0.4 to 5 percent by weight oxidizing agent; and
   v. at least 3 percent by weight pigment or filler or a combination of pigment and filler;

said polybutene being a copolymer of which 3 to 25 percent by weight is a butene-1, butene-2 moiety and 25 to 97 percent by weight is an isobutylene moiety and said admixture containing at least 3 percent by total weight of pigment or filler or a combination of pigment and filler.

4,092,291

NON-OPAQUE FLAME RETARDANT POLYCARBONATE COMPOSITION

Victor Mark, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 429,121, Dec. 28, 1973, Pat. No. 3,948,851. This application Oct. 29, 1975, Ser. No. 626,939

The portion of the term of this patent subsequent to Jul. 5, 1994, has been disclaimed.

Int. Cl.[2] C08K 5/42

U.S. Cl. 260—45.7 S 14 Claims

1. A non-opaque flame retardant aromatic carbonate polymer composition comprising in admixture an aromatic carbonate polymer and from 0.001 to about 2.0 parts per hundred parts of the aromatic carbonate polymer of an additive selected from the group consisting of a monomeric and polymeric alkali metal and alkaline earth metal aromatic sulfonesulfonate, and mixtures of these; said aromatic carbonate polymer and additive having a refractive index in the range of 1.54 to 1.65.

4,092,292

FLAME RETARDANT COMPOSITIONS

Harry Braus, Cincinnati, Ohio, and Jay R. Woltermann, Memphis, Tenn., assignors to National Distillers and Chemical Corp., New York, N.Y.

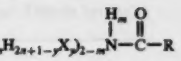
Continuation-in-part of Ser. No. 505,287, Sept. 12, 1974, Pat. No. 3,979,545. This application Jun. 28, 1976, Ser. No. 700,286

The portion of the term of this patent subsequent to Sep. 7, 1993, has been disclaimed.

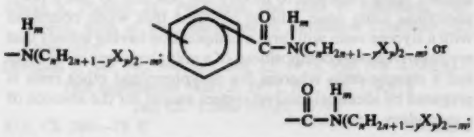
Int. Cl.[2] C08K 3/22, 5/20, 5/16

U.S. Cl. 260—45.75 B 11 Claims

1. A flame retarded composition comprising a solid polymer and a flame retardant amount of a halogen containing amide having the formula:



wherein R is lower alkoxy; lower alkoxy carbonyl;



X is chlorine or bromine; *m* is 0 or 1; *n* is 1–6; and *y* is 1–13.

4,092,293

POLYMERCAPTANS FOR CURING EPOXY RESINS AND METHOD OF PREPARATION THEREOF

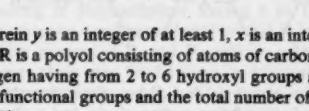
Richard L. Harris, and Paul H. Goble, both of Painesville, Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Jun. 24, 1976, Ser. No. 699,335

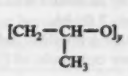
Int. Cl.[2] C08G 59/50

U.S. Cl. 260—47 EC 10 Claims

1. A polymercaptan particularly useful for curing epoxy resins to impart particular resistance to the absorption of water by the resultant thermoset polymers comprising: a propoxylated ether polythiol of the structure



wherein *y* is an integer of at least 1, *x* is an integer of at least 2, and R is a polyol consisting of atoms of carbon, hydrogen, and oxygen having from 2 to 6 hydroxyl groups and free of reactive functional groups and the total number of carbon atoms in R and



is greater than 15.

4,092,294

METHOD FOR PREPARING POLYPHENYLENE ETHERS

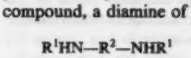
James G. Bennett, Jr., and Glenn Dale Cooper, both of Delmar, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Aug. 30, 1976, Ser. No. 718,834

Int. Cl.[2] C08G 65/44

U.S. Cl. 260—47 ET 20 Claims

1. In a process for forming a polyphenylene ether resin by the oxidative coupling of a 2,6-disubstituted phenolic compound in the presence of a catalyst which comprises a copper compound, a diamine of the formula:



wherein each R^1 is independently isopropyl, a C_{4-8} tertiary alkyl or a cycloalkyl group having no hydrogens on the alpha-carbon atom and R^2 is C_{2-4} alkylene or C_{3-7} cycloalkylene; a tertiary amine; a bromine containing compound selected from the group consisting of hydrogen bromide, alkali metal bromides, alkaline earth metal bromides, 4-bromophenols and mixtures thereof in the presence of an oxygen containing gas, the improvement which comprises adding to the polymerization reaction an amount of a secondary mono-amine of the formula:

wherein R and R′ are independently selected from the group consisting of lower alkyl of from 1 to 12 carbon atoms; said amount being sufficient to modify the reaction so that a polyphenylene ether resin will be obtained that when combined with a styrene resin will form a composition having impact that are improved over compositions of a polyphenylene ether resin and a styrene resin wherein the polyphenylene ether resin is prepared by identical catalyst system except for the absence of a secondary mono-amine.

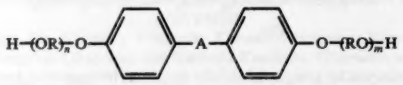
4,092,295

EPOXY RESIN COMPOSITION CONTAINING POLYCARBOXYLIC ACID COMPOUND

Shigeru Takamori, Osaka; Kazutaka Yamashita, and Yoshinao Kono, both of Wakayama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Mar. 28, 1977, Ser. No. 781,854
Claims priority, application Japan, Apr. 16, 1976, 51-43184
Int. Cl.[2] C08L *63/00*
U.S. Cl. 260—47 EA **10 Claims**

1. A resin composition for powder coating compositions consisting essentially of (A) polyepoxy compound containing an average of more than one oxirane group per molecule and (B) polycarboxylic acid obtained by reacting (1) polyoxyalkylene ether of a dihydric phenol having the formula:



wherein

A is alkylene group having 1 to 4 carbon atoms or carbonyl, R is alkylene having 2 to 4 carbon atoms, and each of *m* and *n* is a number of at least 1 and the sum of *m* and *n* is in the range of from 2 to 14,

with (2) trimellitic acid or trimellitic anhydride, in an amount of 1 to 4 moles of (2) per one mole of (1).

4,092,296

EPOXY RESIN COMPOSITIONS

Russell A. Skiff, 7449 Avenue 304, Visalia, Calif. 93277

Filed Aug. 13, 1973, Ser. No. 387,758
Int. Cl.[2] C08L *63/00*; C08G *59/68*
U.S. Cl. 260—47 EP **25 Claims**

1. An autocatalytic process for curing an epoxy resin composition at room temperature without the use of a strong acid or the hydrolyzable ester thereof, said process comprising:

mixing at room temperature an epoxy resin made from epichlorohydrin and a dihydric phenol with at least ½ part of an aqueous solution of a metalic fluoborate salt per 100 parts of resin said composition being free from a strong acid or the hydrolyzable ester thereof; and

maintaining the resulting mixture free from external heat.

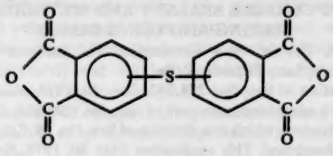
4,092,297

POLYTHIOETHERMIDES

Frank J. Williams, III, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 23, 1974, Ser. No. 500,137
Int. Cl.[2] C08G *73/10*
U.S. Cl. 260—47 CP **3 Claims**

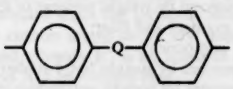
1. A method of making polythioetherimide which comprises effecting reaction in the presence of a cresol solvent between from 0.5 to 2 moles of aromatic bis(thioetheranhydride) of the formula



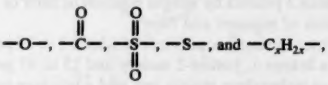
per mole of organic diamine of the formula,

$$H_2NRNH_2,$$

at temperatures of from 100° to 250° C, where R is a divalent organic radical selected from the class consisting of (a) aromatic hydrocarbon radicals having from 6–20 carbon atoms and halogenated derivatives thereof, (b) alkylene radicals and cycloalkylene radicals having from 2–20 carbon atoms, $C_{(2-8)}$ alkylene terminated polydiorganosiloxane, and (c) diavlent radicals included by the formula,



where Q is a member selected from the class consisting of



and *x* is a whole number from 1 to 5 inclusive.

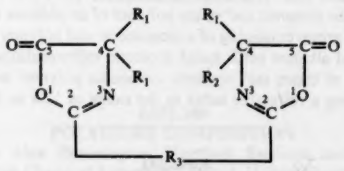
4,092,298

POWDER COATING COMPOSITIONS

Heiko Humbert, Hamburg; Gundolf Fuchs, Steinbeck, Buchholz, and Dietrich Pirck, Seevetal, all of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Filed May 17, 1976, Ser. No. 687,423
Claims priority, application Germany, May 17, 1975, 2522192
Int. Cl.[2] C08G *63/20*
U.S. Cl. 260—75 T **13 Claims**

1. A powder coating composition comprising resinous polyhydroxy compounds as film-forming agents cross-linking agents and the conventional additives, such as levelling agents and optionally pigments, characterised by a bisazlactone as a cross-linking agent having the general formula (I):



wherein R_1 and R_2 are selected from the group consisting of hydrogen, alkyl having 1 to 8 carbon atoms, cycloalkyl having from 4 to 16 carbon atoms or aryl having from 6 to 16 carbon atoms, wherein only one of R_1 and R_2 may be hydrogen, or wherein R_1 and R_2 together with the C in 4-position form a cycloaliphatic ring having from 4 to 12 carbon atoms; wherein R_3 is selected from the group consisting of alkylene having from 2 to 6 carbon atoms or arylene having from 6 to 16 carbon atoms, as the cross-linking agent, and a blocked acid as the activator; wherein said resinous polyhydroxy compounds are selected from the group consisting of (a) polyesters of glycols and terephthalic acid modified with triols and having a hy-

droxyl number of about 95 and (b) copolymers of styrene and unsaturated mono- or dicarboxylic esters having B-hydroxyalkyl groups and a hydroxyl number of about 100; wherein the said coating composition is composed of from 65 to 98 percent by weight of binder, from 0 to 35 percent by weight of pigments, and from 0 to 2 percent by weight of levelling agents and other additives and wherein the said binder is composed of from 83 to 93 percent by weight of said resinous polyhydroxy compounds based on the weight of the binder, from 5 to 15 percent by weight of the said bisazalactone and from 0.25 to 2 percent of the said activator.

4,092,299

HIGH DRAW RATIO POLYESTER FEED YARN AND ITS DRAW TEXTURING

Donald L. MacLean, Raleigh, and Robert T. Estes, Cary, both of N.C., assignors to Monsanto Company, Decatur, Ala.

Filed Jun. 23, 1976, Ser. No. 699,143
Int. Cl.[2] C08G *63/70*
U.S. Cl. 260—75 T 3 Claims

1. A melt spun partially oriented polyester multifilament feed yarn made from a polyester polymer containing a tri or tetrafunctional chain brancher in such an amount that the polymer has 2–14 microequivalents of reactive branching sites per gram of polymer, said feed yarn having a tenacity of about 1.2–3.0, a spun denier of at least about 5 dpf, an elongation of about 60–220%, and a draw ratio (DR) in accordance with the following:

$$DR \geq 5593.7/S$$

where S is 3107–4022 meters per minute and is the melt spinning take-up speed of the multifilament feed yarn.

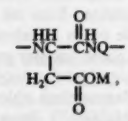
4,092,300

POLYAMIDE ACID SALTS

Edith M. Boldebuck, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 329,428, Feb. 5, 1973, Pat. No. 3,892,716.
This application May 2, 1975, Ser. No. 573,844
Int. Cl.[2] C08G *73/12*
U.S. Cl. 260—78 UA 4 Claims

1. Electrocoatable polyimide salt having from about 5 mole percent to 100 mole percent of chemically combined radicals of the formula,



where M is a base cation having an ionization constant greater than 10^{-2} in water at 25° C, and Q is a divalent organo radical free of aliphatic unsaturation.

4,092,301

ANIONIC POLYMERIZATION OF LACTAM WITH CATALYST, ACTIVATOR AND LITHIUM HALIDE

Saverio Russo; Estella Bianchi; Alberto Ciferri; Barbara Valenti, and Giorgio Bontá, all of Genoa, Italy, assignors to Consiglio Nazionale Delle Richerche, Rome, Italy

Filed Jan. 30, 1976, Ser. No. 653,893
Claims priority, application Italy, Feb. 13, 1975, 12460 A/75
Int. Cl.[2] C08G *69/18*
U.S. Cl. 260—78 L 4 Claims

1. A process for preparing a film and fiber forming polylactam from a lactam having 4–12 carbon atoms in the lactam ring, comprising polymerizing an anhydrous mixture of at least one lactam, an alkaline anionic catalyst, an anionic activator and 1 to 10% by weight based on the weight of the polylactam of at least one lithium halide selected from the group consisting of lithium chloride and lithium bromide.

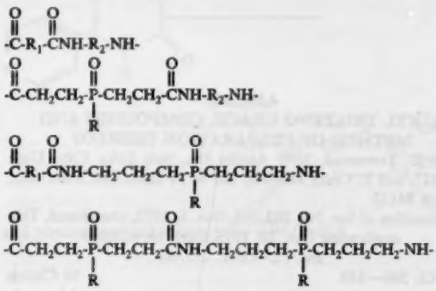
4,092,302

PHOSPHORUS-CONTAINING COPOLYAMIDES AND FIBERS THEREOF

Oscar A. Pickett, Jr., Pensacola, and John W. Stoddard, Gulf Breeze, both of Fla., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 598,505, Jul. 22, 1975, Pat. No. 4,032,517.
This application Mar. 3, 1977, Ser. No. 774,075
Int. Cl.[2] C08G *69/26, 69/42*
U.S. Cl. 260—78 R 4 Claims

1. A fiber-forming copolyamide consisting essentially of recurring units selected from the group consisting of



(I)

(II)

(III)

(IV)

wherein R_1 and R_2 each is a radical selected from the group consisting of polymethylene having 4 to 12 carbon atoms, meta-phenylene and para-phenylene and R is a C_1 to C_4 alkyl, wherein successive R_1 and R_2 radicals when present in the polymer chain may be the same or different and wherein at least one of said R_1 and R_2 radicals is meta-phenylene or para-phenylene and wherein the copolyamide contains a sufficient amount of units selected from units (II) to (IV) to provide a copolyamide containing between 0.5 and 7.5 percent by weight of phosphorus as an integral part of its polymer chain.

4,092,303

POLYACRYLATE ELASTOMERS WITH IMPROVED ELASTICITY

Rudolf Adolf Behrens, Gladstone, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed May 27, 1975, Ser. No. 580,868
Int. Cl.[2] C08F *28/00, 27/06, 28/02*
U.S. Cl. 260—79.5 P 5 Claims

1. A polyacrylate elastomer having improved elasticity produced by (A) copolymerizing a major proportion of one or more acrylic acid esters and from about 1 to about 10 mole percent of an active-halogen containing vinyl monomer to form a copolymer, (B) adding to said copolymer from about 0.5 to about 10 parts, by weight, per hundred thereof, of an unsaturated compound selected from the group consisting of (1) mono- and diesters of acrylic or methacrylic acid and an alkylene diol, (2) mono-, di- and triesters of acrylic or methacrylic acid and a polyhydric alcohol having the formula $R\text{-}C\text{-}CH_2OH)_3$ wherein R is hydrogen or lower alkyl, (3) mono-, di-, tri- and tetraesters of acrylic or methacrylic acid and pentaerythritol, (4) acrylamide or methacrylamide, (5) N-alkyl or N,N-dialkylacrylamides or methacrylamides, (6) N-alkoxyalkyl or N,N-di(alkoxyalkyl)acrylamides or methacrylamides, (7) N-methylolacrylamide or N-methylolmethacrylamide, (8) alkylenebisacrylamides or methacrylamides and (9) oxydialkylenebisacrylamides or methacrylamides and (C) vulcanizing the resultant composition with sulfur.

4,092,304

4-SUBSTITUTED ENKEPHALIN DERIVATIVES

David A. Jones, Jr., Evanston; James M. Schlatter, Glenview; Richard A. Mikulec, Chicago, and Judith A. Reuter, Skokie, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Aug. 9, 1976, Ser. No. 712,460
Int. Cl.[2] C07C *103/52;* A61K *37/00*
U.S. Cl. 260—112.5 R 3 Claims

1. A compound of the formula

H-Tyr-Gly-Gly-W-Y-OH

wherein Y is Leu or Met; W is β-thienyl-Ala;
and the stereochemical configuration of each of the optically active amino acid residues may independently be D, L, or DL.

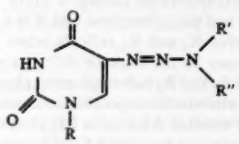
4,092,305

ALKYL TRIAZENO URACIL COMPOUNDS AND METHOD OF PREPARATION THEREOF

Leroy B. Townsend, 3595 Apollo Dr., Salt Lake City, Utah 84117, and T. Craig Thurber, 227 S. 13 East, Salt Lake City, Utah 84115

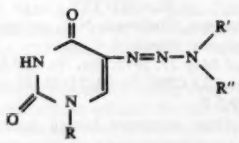
Continuation of Ser. No. 282,362, Nov. 6, 1972, abandoned. This application Oct. 20, 1975, Ser. No. 623,909
Int. Cl.[2] C07C *115/00*
U.S. Cl. 260—140 16 Claims

1. The composition of matter having the structural formula

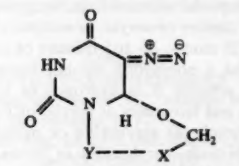


wherein R is hydrogen or a carbohydrate group and R′ and R″ are lower alkyl groups.

10. The method of forming a triazeno compound having the structure



wherein R is hydrogen or a carbohydrate group and R′ and R″ are lower alkyl groups, by reacting a dialkylamine with a compound having the structure



wherein X and Y are H or X and Y is a carbohydrate group, said reaction conducted at a temperature at least 20° C and at a pH substantially below the pKa value of the nitrogen in the three position.

4,092,306

OXIDATION OF HYDRAZONES TO THE CORRESPONDING DIAZO COMPOUNDS IN THE PRESENCE OF A PHASE TRANSFER AND AN OXIDATION CATALYST WHICH IS IODINE, AN IODIDE OR AN IODONIUM SALT

David Thomas Eastlick, Lancaster, England, assignor to Glaxo Laboratories Limited, Greenford, England

Continuation of Ser. No. 377,248, Jul. 9, 1973, abandoned. This application Sep. 21, 1976, Ser. No. 725,234
Int. Cl.[2] C07C *113/00, 113/02, 113/04*
U.S. Cl. 260—141 18 Claims

1. A process for the preparation of a diazo compound of the formula:

where R^1 is selected from the group consisting of hydrogen and R, where R is selected from the group consisting of phenyl, naphthyl, benzyl, thienyl, furyl, pyridinyl, thienylmethyl, furylmethyl, C_{1-6} alkenyl, C_{5-7} cycloalkenyl, C_{1-6} alkyl, and C_{5-7} cycloalkyl groups and such groups substituted by at least one of chloro, bromo, cyano, nitro, C_{1-6} alkyl, C_{1-6} alkylsulphonyl, and C_{1-6} alkoxy; R^2 has independently any of the defined meanings for R; or where R_1 and R_2 together with the intervening carbon atom form a member selected from the group consisting of cyclopentyl, cyclohexyl, fluorenyl, pyranyl and piperidinyl which comprises reacting a hydrazone of the formula:

where R^1 and R^2 are as defined above, with 0.5–2.0 moles per mole of hydrazone of an oxidising agent in the presence of 0.5–10 moles of base per mole of hydrazone, an oxidation catalyst and a phase transfer catalyst in a two phase reaction medium, said base being an alkali metal or alkaline earth metal hydroxide, bicarbonate or carbonate, a guanidine, a basic amide or a quaternary ammonium hydroxide, said oxidising agent being a member selected from the group consisting of a peracid, an N-haloamide or an N-halosulphonamide or mixtures thereof, and said phase transfer catalyst being selected from the group consisting of tetra-n-butyl ammonium hydroxide, tri-n-octyl-n-propylammonium chloride, 2, 5, 8, 15, 18, 21-hexaoxatricyclo (20.4.0.0.^{19,14}) hexacosane, hexadecyltributylphosphonium bromide, tetrabutylammonium-chloride or -iodide, benzyltriethyl ammonium chloride, dodecyltrimethyl ammonium chloride and benzyltrimethyl ammonium hydroxide, said oxidation catalyst being a member selected from the group consisting of iodine, an iodide and an iodenium salt.

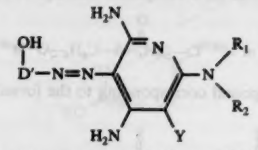
4,092,307

PYRIDYL AZO ARYL METAL COMPLEX DYES

Hans Ulrich Schutz, Basel, and Arthur Buhler, Rheinfelden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 25, 1976, Ser. No. 670,310
Claims priority, application Switzerland, Apr. 16, 1975, 4846/75
Int. Cl.[2] C09B *45/06, 45/08, 45/10, 45/12*
U.S. Cl. 260—146 R 3 Claims

1. Copper, nickel, cobalt or chromium complexes of an azo dye of the formula



wherein D' is a benzene or naphthalene radical which carries the hydroxyl group in ortho-position to the azo group and optionally contains as further substituents one or two sulpho groups, low molecular alkyl or alkoxy groups, chlorine or bromine atoms, trifuloromethyl, nitro, phenylazo, sulphophenylazo, acyl, acyloxy, acylamino, alkylsulphonyl, phenylsulphonyl, sulphonamido, alkylsulphonamido, phenylsulphonamido or cyano groups, R_1 is a hydrogen atom or a low molecular alkyl group, R_2 is a sulphoaryl radical or a low molecular sulphoalkyl radical, or R_1 and R_2, together with the nitrogen atom to which they are attached, form a morpholino, thiomorpholino, pyrrolidino or piperazino radical, and wherein Y is a cyano or carbonamido group, said azo dye containing at least one sulpho, sulphonamido, alkylsulphonamido, phenylsulphonamido, alkylsulphonyl or phenylsulphonyl group.

4,092,308

4-SULPHOMETHYL SUBSTITUTED HYDROXYPYRIDONE AZO DYESTUFFS

Gert Hegar, Schonenbuch, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

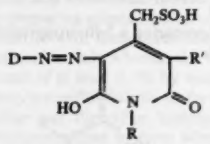
Continuation of Ser. No. 604,402, Aug. 13, 1975, abandoned, which is a continuation of Ser. No. 396,914, Sep. 13, 1973, abandoned. This application Oct. 29, 1976, Ser. No. 736,930

Claims priority, application Switzerland, Oct. 5, 1972, 14561/72; Aug. 20, 1973, 11966/73

Int. Cl.² C09B *29/36, 62/08, 62/24, 62/50*

U.S. Cl. 260—153 **4 Claims**

1. An azo dyestuff of the formula



in which

D is phenyl which is unsubstituted or substituted by sulfo, chloro, bromo, methyl, nitro, cyano, methylsulfonyl, trifluoromethyl, carbomethoxy, carboethoxy, hydroxy, amino, ortho methoxy, acetylamino, carboxy, cyclohexyloxycarbonyl, isopropylaminosulfonyl, sulphamato, phenylazo, sulfophenylazo, disulfonaphthylazo or a fiber reactive group capable of reacting with the hydroxy groups of cellulose or the amido groups of polyamide; napthyl substituted by sulfo, acetylamino, γ-isopropyloxypropylaminosulfonyl or hydroxy; thiazole; quinoline; benzthiazole substituted by methyl; 1,3,5-thiadiazole or benzisothiazole;

R is hydrogen; alkyl of 1-4 carbon atoms; β-hydroxyethyl; β-chloroethyl; β-acetylaminoethyl; phenyl which is unsubstituted or substituted by methoxy, chloro or acetamino; benzyl; or a group of the formula $-(CH_2)_n-NH-Z$ wherein

n is 1-4,

Z is a fiber reactive group capable of reacting with the hydroxy groups of cellulose or the amido groups of polyamides; and

R' is hydrogen, chloro, bromo, cyano, carbonamido, nitro, nitroso, amino, methylsulfonyl or acetylamino.

4,092,309

DERIVATIVES OF AMOXICILLIN

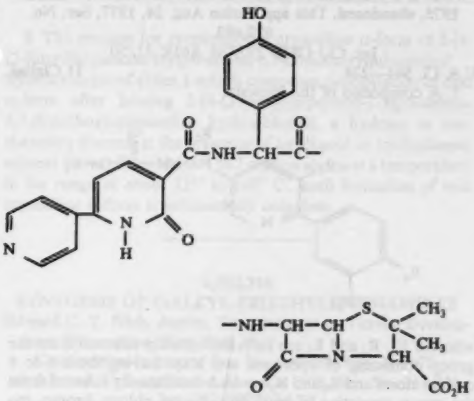
Thomas Frederick Mich, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Apr. 27, 1977, Ser. No. 791,270

Int. Cl.² C07D *499/68*

U.S. Cl. 260—239.1 **3 Claims**

1. A compound of the formula



and pharmaceutically-acceptable salts thereof.

4,092,310

DIFLUOROSTEROIDS AND PROCESSES FOR THEIR MANUFACTURE

Michel Biollaz, Basel, and Jaroslav Kalvoda, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

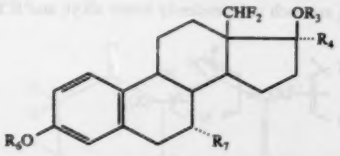
Filed Jul. 23, 1975, Ser. No. 598,300

Claims priority, application Switzerland, Jul. 30, 1974, 10478/74

Int. Cl.² C07J *17/00*

U.S. Cl. 260—239.55 D **10 Claims**

1. A compound of the general formula (IB)



(IB)

wherein R_3 denotes a hydrogen atom or a lower alkyl or lower alkanoyl group, R_4 denotes a hydrogen atom or a lower aliphatic hydrocarbon radical, or R_3 and R_4 conjointly represent a valency bond, R_6 denotes a hydrogen atom or a lower alkyl group and R_7 denotes a hydrogen atom or the methyl group.

4,092,311

HYPOTENSIVE ALKYL-3-[6-(ARYL)-3-PYRIDAZINYL]-CARBAZATES

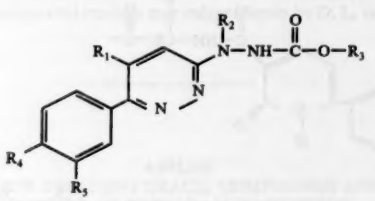
John William Hanifin, Jr.; Daniel Bryan Moran, both of Suffern; Jay Donald Albright, Nanuet, all of N.Y., and George Rodger Allen, Jr., Old Tappan, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 692,254, Jun. 3, 1976, abandoned, which is a continuation-in-part of Ser. No. 552,024, Feb. 24, 1975, abandoned. This application Aug. 24, 1977, Ser. No. 827,403

Int. Cl.[2] C07D *237/20*; A61K *31/50*

U.S. Cl. 544—224 **11 Claims**

1. A compound of the formula:



wherein R_1, R_2 and R_3 are each individually selected from the group consisting of hydrogen and alkyl having from 1 to 4 carbon atoms and R_4 and R_5 are each individually selected from the group consisting of hydrogen, fluoro, chloro, bromo, cyano, methoxy, nitro, amino, trifluoromethyl and carbamoyl with the proviso that at least one of R_4 and R_5 is hydrogen.

4,092,312

PROCESS FOR PREPARING PHOSPHOROTHIOATES AND PHENYLPHOSPHONOTHIOATES

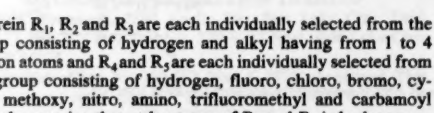
Lorraine M. Kroposki, Walnut Creek, Calif., and Masao Yoshimine, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

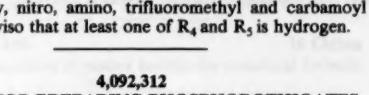
Division of Ser. No. 600,543, Jul. 31, 1975, Pat. No. 4,016,225, which is a division of Ser. No. 361,937, May 21, 1973, Pat. No. 3,907,815, which is a continuation-in-part of Ser. No. 187,139, Oct. 6, 1971, abandoned. This application Jan. 21, 1977, Ser. No. 761,186

Int. Cl.[2] C07F *9/09*, *9/165*

U.S. Cl. 544—243 **15 Claims**

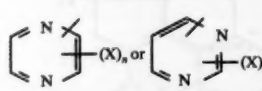
1. In the process of preparing a compound corresponding to the formula





wherein:

R_1 and R_2 are each independently lower alkyl; and R is

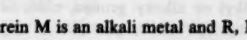


wherein:

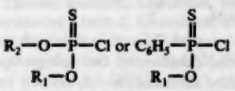
n is 0, 1, 2 or 3; and

X is nitro, cyano, halo, lower alkyl, lower alkoxy, lower alkylthio or lower alkylsulfinyl, with the proviso that R does not bear more than one nitro group, lower alkylthio group or lower alkyl-sulfinyl group;

by reacting in an inert liquid reaction medium under neutral or alkaline conditions (a) a compound corresponding to the formula



with (b) a compound corresponding to the formula



wherein M is an alkali metal and R, R_1 and R_2 have the aforesaid meaning;

the improvement consisting of conducting the process in the presence of a small but catalytic amount of (1) a quaternary ammonium salt having a minimum solubility of at least 1 weight percent in the liquid reaction medium at 25° C and (2) 1,4-diazabicyclo[2.2.2]octane.

4,092,313

PREPARATION OF 5-FLUOROPYRIMIDIN-4-ONE DERIVATIVES

Mitugi Yasumoto, Itano; Junichi Yamashita; Ichiro Yamawaki, both of Tokushima; Norio Unemi, Itano; Kenji Kitazato, Tokushima; Sadao Hashimoto, Itano, and Setsuro Fujii, Tokushima, all of Japan, assignors to Taisho Pharmaceutical Company Limited, Tokyo, Japan

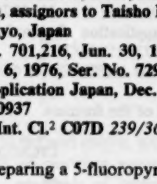
Division of Ser. No. 701,216, Jun. 30, 1976. This application Oct. 6, 1976, Ser. No. 729,980

Claims priority, application Japan, Dec. 16, 1975, 50-150936; Dec. 16, 1975, 50-150937

Int. Cl.[2] C07D *239/36*

U.S. Cl. 544—313 **3 Claims**

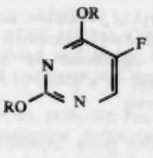
1. A process of preparing a 5-fluoropyrimidin-4-one derivative of the formula



wherein

R is straight-chain or branched-chain alkyl having 4 to 18 carbon atoms, straight-chain or branched-chain alkenyl having 2 to 18 carbon atoms, alkylene oxido having 3 to 10 carbon atoms, aryl or aralkyl,

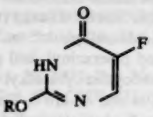
comprising reacting 2,4-dichloro-5-fluoropyrimidine with an alcoholate or phenolate of the formula ROM wherein R is as defined above and M is an alkali metal to obtain a 2,4-di-substituted-5-fluoropyrimidine derivative of the formula



wherein

R is as defined above, and hydrolyzing the derivative in the presence of a basic substance.

3. A process for preparing a 5-fluoropyrimidin-4-one derivative of the formula



wherein

R is straight-chain or branched-chain alkyl having 4 to 18 carbon atoms, straight-chain or branched-chain alkenyl having 2 to 18 carbon atoms, alkylene oxido having 3 to 10 carbon atoms, aryl or aralkyl,

comprising reacting 2-chloro-5-fluoropyrimidin-4-one with an alcoholate or phenolate of the formula ROM wherein R is as defined above and M is an alkali metal.

4,092,314
PREPARATION OF 4,6-DIAMINO-5-ARYLAZOPYRIMIDINES AND ADENINE COMPOUNDS

Michael C. Vander Zwan, Somerset, and Donald F. Reinhold, North Plainfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 593,910, Jul. 7, 1975, abandoned. This application Oct. 18, 1976, Ser. No. 733,489
Int. Cl.² C07D *473/34*
U.S. Cl. 544—277 **10 Claims**

1. A process for preparing 4,6-diamino-5-phenylazopyrimidine which comprises reacting phenylazomalononitrile with formamide and at least 1 mole of ammonia per mole of phenylazomalononitrile in the presence of an ammonium salt wherein the ammonium salt is present in an amount of at least 0.1% by weight based on the weight of the phenylazomalononitrile, wherein the reaction is carried out at a temperature of from about 50° to about 400° C. wherein the ammonium salt is selected from the group consisting of ammonium acetate, ammonium sulfate, ammonium iodide, ammonium chloride, ammonium carbonate, ammonium propionate, ammonium benzoate and ammonium nitrate.

6. A process for preparing adenine which comprises reacting phenylazomalononitrile with formamide and ammonia in the presence of an ammonium salt wherein the ammonium salt is present in an amount of at least 0.1% by weight based on the weight of the phenylazomalononitrile to form 4,6-diamino-5-phenylazopyrimidine and thereafter hydrogenating the 4,6-diamino-5-phenylazopyrimidine to form adenine wherein the ammonium salt is selected from the group consisting of ammonium acetate, ammonium sulfate, ammonium iodide, ammonium chloride, ammonium carbonate, ammonium propionate, ammonium benzoate and ammonium nitrate.

4,092,315
NOVEL CRYSTALLINE FORMS OF PRAZOSIN HYDROCHLORIDE

Ernest J. Bianco, Niantic, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Mar. 1, 1976, Ser. No. 662,937
Int. Cl.² C07D *239/94*
U.S. Cl. 544/291 **4 Claims**

1. The crystalline α-form of 2-[4-(2-furoyl)piperazin-1-yl]-4-amino-6,7-dimethoxyquinazoline hydrochloride characterized by the infrared spectrum in potassium bromide having the following absorption bands:

Wavelength, Microns	Wavelength, Microns	Wavelength, Microns
2.95	7.30	10.67
3.10	7.81	11.05
3.25	8.08	11.30
3.50	8.28	11.66
6.12	8.40	11.90
6.26	8.70	12.60

-continued

Wavelength, Microns	Wavelength, Microns	Wavelength, Microns
6.39	9.02	13.10
6.54	9.25	13.31
6.75	9.60	13.87
6.81	9.85	13.95
7.02	10.02	14.82
7.22		

2. The process for preparing the crystalline α-form of 2-[4-(2-furoyl)piperazin-1-yl]-4-amino-6,7-dimethoxyquinazoline hydrochloride of claim 1 which comprises precipitation of said α-form after heating 2-[4-(2-furoyl)piperazin-1-yl]-4-amino-6,7-dimethoxyquinazoline hydrochloride, a hydrate or methanolate thereof, in the presence of an alkanol or cycloalkanol solvent having from about 5 to 7 carbon atoms at a temperature in the range of about 125° to 160° C., until formation of said crystalline α-form is substantially complete.

4,092,316
SYNTHESIS OF C-ALKYL-TRIETHYLENEDIAMINES

Edward C. Y. Nieh, Austin, Tex., assignor to Texaco Development Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 546,332, Feb. 3, 1975, abandoned. This application Dec. 23, 1976, Ser. No. 753,743
Int. Cl.² C07D *24/38*
U.S. Cl. 544—351 **14 Claims**

1. A liquid phase process for the synthesis of C-alkyl triethylenediamines comprising the steps of:

initially heating a piperazine feedstock selected from a group consisting of a C-lower alkyl or C-poly lower alkyl substituted piperazine containing at least one N-(2-hydroxy ethyl) group; an unsubstituted, or C-lower alkyl substituted, or C-poly lower alkyl substituted piperazine having at least one N-(2-hydroxyalkyl) group wherein the hydroxyalkyl contains at least three carbon atoms, and mixtures thereof to elevated temperatures of about 220° C to 300° C in the presence of a catalytic amount of a pentavalent acidic phosphorus compound having at least one P—O—R group wherein R is hydrogen or a univalent organic radical and,

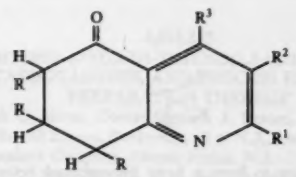
recovering said C-alkyl triethylenediamine product.

4,092,317
PREPARATION OF QUINOLINE DERIVATIVES

Adrian Charles Ward Curran, North Humberside, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

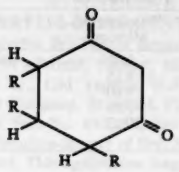
Continuation-in-part of Ser. No. 486,125, Jul. 5, 1974, Pat. No. 3,998,831. This application Sep. 5, 1975, Ser. No. 610,798
Int. Cl.² C07D *215/20*
U.S. Cl. 260—283 SY **8 Claims**

1. A process for preparing a 5-oxotetrahydroquinoline of formula I



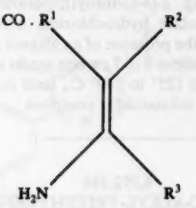
I

wherein R, R^1, R^2 and R^3 are the same or different and are selected from hydrogen and methyl which process comprises heating at about 120° C a compound of formula II



II

wherein R is as defined above with a compound of formula III



III

wherein R^1, R^2 and R^3 are as defined above.

4,092,318

INDANTETROL DERIVATIVES

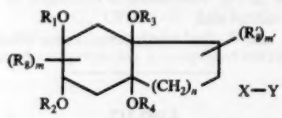
Frederic Peter Hauck, Somerville; Joyce Reid, Highland Park; Venkatachala L. Narayanan, Hightstown; Christopher M. Cimarusti, Hamilton; Rudiger D. Haugwitz, Titusville, all of N.J., and Joseph E. Sundeen, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 570,121, Apr. 21, 1975, Pat. No. 3,984,407, which is a division of Ser. No. 372,448, Jun. 21, 1973, Pat. No. 3,894,031, which is a continuation of Ser. No. 71,229, Sep. 10, 1970, abandoned. This application Mar. 15, 1976, Ser. No. 666,983

Int. Cl.² C07D *211/22*

U.S. Cl. 260—293.56 **4 Claims**

1. A compound of the structure



wherein R_1, R_2, R_3 and R_4 are the same or different and are selected from the group consisting of hydrogen, lower alkyl, trifluoromethyl, mono-halo-lower alkyl, lower alkanoyl, amido, lower alkoxyalkylene and lower alkoxy carbonyl, X is a single bond or a straight or branched chain alkylene group containing from 1 to 10 carbons, Y is

wherein

is taken together to form a 5- or 6-membered heterocyclic radical, the heterocyclic groups or radicals by themselves or in conjunction with another moiety being selected from the group consisting of piperidyl, (lower alkyl)piperidyl, di(lower alkyl)piperidyl, (lower alkoxy)piperidyl, hydroxypiperidyl, aminomethylpiperidyl, pyrrolidyl, lower alkylpyrrolidyl, di(-lower alkyl)pyrrolidyl, lower alkoxypyrrolidyl, piperazinyl, and lower alkyl, di-loweralkyl, lower alkoxy or hydroxy-lower alkyl substituted piperazinyl, and pyridinyl, R_8 and R'_8 are lower alkyl or monocyclic cycloalkyl containing 3 to 6 ring members, n is 1 to 3, m and m' are 0, 1 or 2;

stereoisomers thereof, physiologically acceptable acid salts thereof, physiologically acceptable quaternary salts thereof, and N-oxides thereof.

4,092,319

SULFUR-CONTAINING ANTIMICROBIAL ESTER-AMIDES

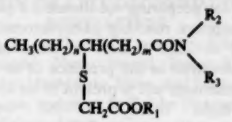
Robert R. Mod, New Orleans; Frank C. Magne, Metairie; Gene Sumrell, New Orleans, and Arthur F. Novak, Baton Rouge, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 737,457, Nov. 1, 1976, Pat. No. 4,061,634. This application Sep. 16, 1977, Ser. No. 833,882

Int. Cl.² C07D *295/18*

U.S. Cl. 260—293.85 **2 Claims**

1. A sulfur-containing ester amide having antimicrobial activity and the general structure:



where R_1 is a lower alkyl or alkenyl group; R_2 and R_3 cojointly form a piperidine ring; $n + m$ add up to 15 and $n = m$ plus or minus 1.

4,092,320

CERTAIN 1-(N-ACYL)-CARBOTHIOAMIDES OF 1,5-NAPHTHYRIDINE DERIVATIVES

Adrian Charles Ward Curran, South Cave, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

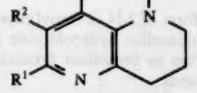
Continuation-in-part of Ser. No. 676,034, Apr. 12, 1976, abandoned, which is a continuation-in-part of Ser. No. 553,964, Feb. 29, 1975, Pat. No. 3,960,876. This application Apr. 7, 1977, Ser. No. 785,636

Claims priority, application United Kingdom, Mar. 5, 1974, 9764/74; Jul. 12, 1974, 30935/74

Int. Cl.² C07D *471/04*

U.S. Cl. 260—294.8 C **4 Claims**

1. A compound of formula (I)



(I)

or a pharmaceutically acceptable acid addition salt thereof wherein R^1, R^2 and R^3 are the same or different and represent a hydrogen atom or lower alkyl of 1–6 carbon atoms which may be substituted by lower alkoxy of 1–6 carbon atoms, and R^4 is benzoyl or halobenzoyl with the proviso that when R^1 and R^2 or R^2 and R^3 are both alkyl they are selected from normal or secondary alkyl groups.

4,092,321

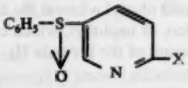
PROCESS FOR THE PREPARATION OF IMIDAZO [1,2-a] PYRIDINES

Richard J. Bochis, East Brunswick, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

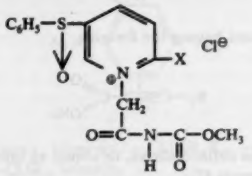
Filed Jun. 16, 1977, Ser. No. 806,974
Int. Cl.[2] C07D *471/04*
U.S. Cl. 260—294.8 C 6 Claims

1. A process for the preparation of a compound having the formula:

which comprises treating a compound having the formula:



wherein X is a halogen, loweralkoxy or loweralkylthio, with methyl chloroacetyl carbamate to form:



which is treated with ammonia and then heated in order to form the desired product.

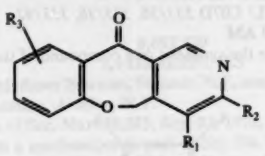
4,092,322

1-BENZOXEPINO[4,3-c]PYRIDINES

Sylvester Klutchko, Hackettstown, and Max von Strandtmann, Rockaway, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Feb. 14, 1977, Ser. No. 768,258
Int. Cl.[2] C07D *491/04*
U.S. Cl. 260—294.9 3 Claims

1. A compound of the formula:



I

wherein R_1 may be hydrogen or lower alkyl, R_2 may be cyano, carboxamido, carboxy or ethoxycarbonyl, and R_3 may be hydrogen, lower alkyl, halogen, hydroxy or lower alkoxy.

4,092,323

HYDRAZINE DERIVATIVES OF PYRIDYL-KETONES

Robert Foster; Roger Edwin Preston, and Graham Ernest Robinson, all of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 718,625, Aug. 30, 1976, Pat. No. 7,046,871. This application May 9, 1977, Ser. No. 794,929
Claims priority, application United Kingdom, Sep. 16, 1975, 38032/75
Int. Cl.[2] C07D *213/04*
U.S. Cl. 260—295 H 3 Claims

1. A protected ketone derivative of the formula $(R^1O)_2$-.PO.CH_2.CR^3. CH_2OR^2, wherein R^1 is C_{1-6}-alkyl, R^2 is 5-chloro-2-pyridyl, and R^3 is semicarbazono, thiosemicarbazono, oximino, C_{1-6}-alkyloxyimino, hydrazono, C_{1-6}-alkylhydrazono, phenylhydrazono, or phenylhydrazono substituted in the phenyl part with one or more substituents selected from halogen, C_{1-3}-alkyl or alkoxy, or nitro.

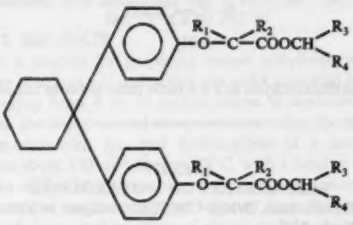
4,092,324

DIHETEROCYCLIC ESTERS OF 4-(1,1-BIS-(PHENOXY-PROPIONIC OR -BUTOYRIC ACID)-CYCLOHEXANE)α-METHYL SUBSTITUTED

Yoshio Suzuki, Itami; Masayoshi Minai, Minoo; Noritaka Hamma, Ibaragi; Eiichi Murayama, Takarazuka, and Shunji Aono, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 491,033, Jul. 23, 1974, Pat. No. 4,008,265, which is a continuation of Ser. No. 255,244, May 19, 1972, abandoned. This application Aug. 23, 1976, Ser. No. 716,666
Claims priority, application Japan, May 22, 1971, 46-34866; May 22, 1971, 46-34867
Int. Cl.[2] C07D *213/55*
U.S. Cl. 260—295.5 R 4 Claims

1. A bisphenoxy carboxylic acid derivative represented by the general formula



wherein R_1 and R_2 each are a lower alkyl; R_3 is hydrogen and R_4 is

pyridyl

and pharmaceutically acceptable acid acid salts thereof.

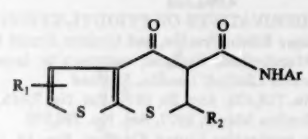
4,092,325

5,6-DIHYDRO-4-OXO-4H-THIENO[2,3-b]THIOPYRAN-5-CARBOXAMIDES, AND PROCESS FOR THE PREPARATION THEREOF

Jagadish C. Sircar, Dover; Stephen J. Kesten, Morris Plains, and Harold Zinnes, Rockaway, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 10, 1976, Ser. No. 749,507
Int. Cl.[2] C07D *495/04*
U.S. Cl. 260—307 H 3 Claims

1. A compound of the formula I



I

wherein R_1 is hydrogen or lower alkyl; R_2 is hydrogen or lower alkyl; and Ar is isoxazolyl or 5-substituted isoxazolyl wherein the 5-substituent is lower alkyl, halo, lower alkoxy or trifluoromethyl; or its pharmaceutically acceptable salts.

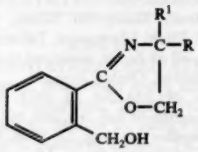
4,092,326

PROCESS FOR PRODUCTION OF SUBSTITUTED OXAZOLINES

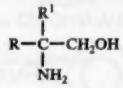
Mohammed T. Shipchandler, Terre Haute, Ind., assignor to IMC Chemical Group, Inc., Terre Haute, Ind.

Filed Dec. 13, 1976, Ser. No. 749,859
Int. Cl.² C07D *263/14*
U.S. Cl. 260—307 F **6 Claims**

1. A method for the production of oxazolines represented by the formula



where r is an alkyl group of 1 to 3 carbon atoms and R^1 is hydrogen or methyl comprising reacting an alkanolamine represented by the formula



with o-phthalaldehyde in a 1:1 mole ratio at room temperature.

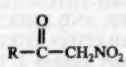
4,092,327

PREPARATION OF ISOXAZOLINES

Roger G. Duranleau, Bridge City, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Nov. 5, 1976, Ser. No. 738,996
Int. Cl.² C07D *261/20*
U.S. Cl. 260—307 DA **25 Claims**

1. A method of preparing 3-acylisoxazolines which comprises contacting a C_5 to C_{20} alkene corresponding to the formula $R^1—CH=CH—R^2$, wherein R^1 and R^2 can be hydrogen, alkyl having from 1 to 18 carbon atoms, aryl having from 6 to 18 carbon atoms, or wherein R^1 and R^2 taken together form a polymethylene group of 1 to 18 carbon atoms, and an alpha-nitroketone of the formula



where R is an alkyl group of 1 to 20 carbon atoms or an aryl group of 6 to 20 carbon atoms in the presence of catalytic amounts of an organic acid having 2 to 18 carbon atoms and a pk_a of about 4.0 to about 0.5 at a temperature of from about 50° to 150° C.

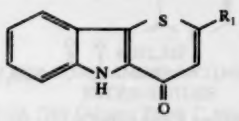
4,092,328

PROCESS FOR THE PREPARATION OF INDOLOTHIOPYRONES AND INDOLYLTHIO ACID INTERMEDIATES USED IN THEIR PREPARATION

Richard E. Brown, East Hanover, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

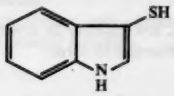
Division of Ser. No. 468,349, May 9, 1974, Pat. No. 3,971,806. This application May 10, 1976, Ser. No. 685,039
Int. Cl.² C07D *513/04*; A61K *31/40*; C07D *495/04*
U.S. Cl. 260—326.5 SA **1 Claim**

1. A process for preparing a compound having the formula I:



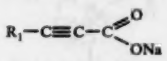
I

wherein R_1 is hydrogen, 1 to 6 carbon lower alkyl, phenyl, mono-nitro-substituted phenyl wherein the nitro group is in the ortho or para position, or naphthyl, which comprises the steps of reacting a compound of the formula II:

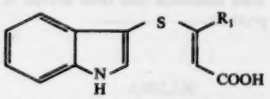


II

with a compound having the formula



wherein R_1 is as defined above, to obtain an intermediate acid having the formula III:



III

wherein R_1 is as defined above; and cyclizing the intermediate acid by the addition of an acid catalyst selected from the group consisting of sulfuric acid, trifluoroacetic acid, and polyphosphoric acid.

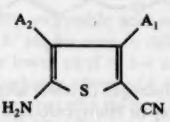
4,092,329

PROCESS FOR THE SYNTHESIS OF CERTAIN 2-AMINO-5-CYANOTHIOPHENES

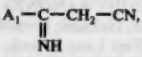
Armand Jotterand, Dornach, SO, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Division of Ser. No. 420,223, Nov. 29, 1973, abandoned. This application Jul. 18, 1975, Ser. No. 597,003
Claims priority, application Switzerland, Dec. 1, 1972, 17535/72; Dec. 12, 1972, 18199/72
Int. Cl.² C07D *333/36, 333/38, 333/42*
U.S. Cl. 260—329 AM **18 Claims**

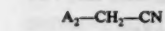
1. A process for the synthesis of a compound of the formula



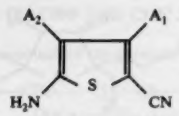
comprising reacting a compound of the formula



or a tautomer thereof,
with a compound of the formula

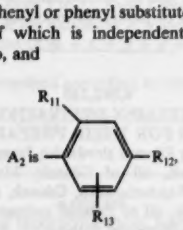


and with sulfur, in an inert organic medium and at a reaction temperature ranging from room temperature to the boiling point of the reaction mixture,
whereby a compound of the formula



is obtained, wherein

A_1 is C_{1-8}alkyl, phenyl or phenyl substituted by 1 or 2 substituents each of which is independently halo, C_{1-3}alkyl, cyano or nitro, and



cyano, C_{1-4}alkoxy, phenoxy, $-CONR_1R_2$, $-CSNR_1R_2$, $-COOR_3$ or $-COR_4$, wherein

R_1 is hydrogen; C_{1-8}alkyl; C_{1-8}alkyl substituted by hydroxy or phenyl; C_{5-7}cycloalkyl; phenyl or phenyl substituted by 1 to 3 substituents each of which is independently chloro or C_{1-3}alkyl,

R_2 is hydrogen, C_{1-8}alkyl or C_{1-5}-hydroxyalkyl,

R_3 is C_{1-8}alkyl; C_{5-7}cycloalkyl; C_{1-8}alkyl substituted by hydroxy, cyano, chloro, bromo, fluoro or phenyl; phenyl or phenyl substituted by methyl or ethyl,

R_4 is C_{1-8}alkyl; C_{1-8}alkyl substituted by hydroxy, cyano, chloro, bromo or fluoro; phenyl or phenyl substituted by methyl or ethyl,

R_{11} is hydrogen, C_{1-3}alkylsulfonyl, nitro or cyano,

R_{12} is hydrogen, C_{1-3}alkylsulfonyl, nitro, cyano, C_{1-3}alkyl or halo, and

R_{13} is hydrogen, C_{1-3}alkyl or halo, with the provisos that

(a) at least one of R_{11} and R_{12} is C_{1-3}alkylsulfonyl, nitro or cyano,

(b) when one of R_{11} and R_{12} is C_{1-3}alkylsulfonyl, the other is other than C_{1-3}alkylsulfonyl, nitro or cyano, and

(c) R_{13} is hydrogen when R_{12} is C_{1-3}alkyl or halo.

4,092,330

1,4-OXAZEPINES

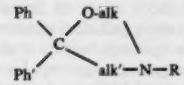
Robert Mathews Bowman, Summit, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 615,255, Sep. 22, 1975, Pat. No. 4,010,166, which is a continuation-in-part of Ser. No. 526,758, Nov. 25, 1974, Pat. No. 3,988,448. This application Oct. 20, 1976, Ser. No. 734,075

Int. Cl.² C07D *269/00*

U.S. Cl. 260—333 **6 Claims**

1. A compound of the formula



wherein each of alk and alk' is ethylene, R is (PhCO or CN) $-C_nH_{2n}$; each of Ph and Ph' is phenyl, unsubstituted or substituted by up to three members of lower alkyl, lower alkoxy, lower alkylmercapto, hydroxy, halogeno or trifluoromethyl; and *n* is an integer from 1 to 4; or a therapeutically acceptable acid addition salt thereof.

4,092,331

PREPARATION OF KETONE ACETALS

Silvain Achiel Raoul Dewaele, Evergem, Belgium, assignor to s.a. Texaco Belgium n.v., Brussels, Belgium

Filed May 25, 1976, Ser. No. 689,776

Claims priority, application United Kingdom, Dec. 30, 1975, 53095/75

Int. Cl.² C07D *317/44*

U.S. Cl. 260—340.5 R **10 Claims**

1. A process for the preparation of ketone bisacetals from polyhydric phenols containing at least two pairs of hydroxy groups in ortho-positions which comprises reacting a polyhydric phenol having at least four OH groups including at least two pairs of OH groups in ortho-positions with a ketone, or a dialkyl acetal of such a ketone, in the presence of a nonaqueous solvent and a strong Lewis acid catalyst.

4,092,332

PROCESS FOR MANUFACTURING MALEIC ANHYDRIDE

Marshall C. Freerks, and Seth Randle, Sr., both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 351,402, Sep. 16, 1973, abandoned. This application Jul. 2, 1976, Ser. No. 701,765

Int. Cl.² C07D *307/60*

U.S. Cl. 260—346.75 **5 Claims**

1. In a process for preparing maleic anhydride wherein a mixture of an oxygen-containing gas and a saturated hydrocarbon having from 4 to 10 carbon atoms is contacted with a catalyst, the improvement comprises contacting the mixture of oxygen-containing gas and hydrocarbon at a temperature between about 350° and about 600° C. with a catalyst prepared from an acid soluble precursor comprising phosphorus, vanadium, oxygen and a component selected from the group consisting of silicon and mixtures of silicon and titanium, wherein the phosphorus to vanadium atom ratio is in the range of about 1:2 to about 2:1, the component to phosphorus atom ratio is between about 0.05:1, and about 0.1:1, and at least 50 atom percent of the vanadium is in the tetravalent state.

4,092,333

2-ACYL-5-SUBSTITUTED THIATETRAHYDROFURAN-4-ONES

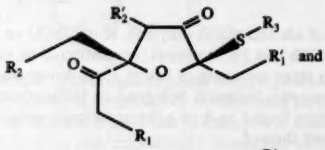
Braja Dulal Mookherjee, Holmdel; William J. Evers, Middletown, both of N.J., and Alfred E. Goossens, New York, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

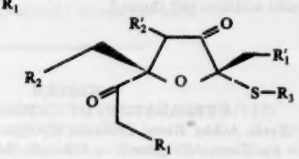
Filed Jul. 28, 1977, Ser. No. 819,888

Int. Cl.² C07D *307/32, 307/64*

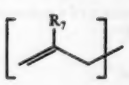
U.S. Cl. 260—347.2 **2 Claims**

1. A genus of 2-acyl-5-substituted thiatetrahydrofuran-4-one compounds selected from the group of compounds having the structures:

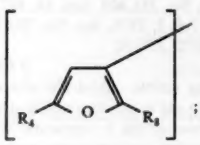

and



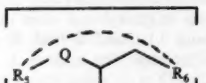
wherein R_1, R_2, R_1' and R_2' are the same or different and each is selected from the group consisting of hydrogen and methyl and R_3 is selected from the group consisting of C_1–C_9 alkyl; benzyl; phenyl; substituted or unsubstituted allyl having the structure:



3-furyl substituted or unsubstituted having the structure:



oxy or hydroxy alkyl having the structure:



wherein Q is:

and R_5 and R_6 are the same or different lower alkyl taken separately or, taken together, R_5 and R_6 complete a cyclialkyl ring; and wherein each of R_4, R_7 and R_8 are the same or different and are hydrogen or methyl.

4,092,334

5-ACYL-2-(FURFURYLTHIO)DIHYDRO-2,5-DIALKYL-3-[2H]FURANONES

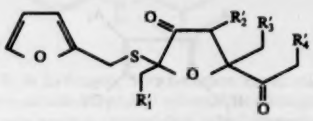
Braja Dulal Mookherjee, Holmdel; Donald Arthur Withycombe, Lincroft; Ira Katz, West Long Branch, all of N.J.; Alfred E. Goossens, New York, N.Y.; Manfred Hugo Vock, Locust, N.J.; William John Evers, Middletown, N.J.; Joaquin F. Vinals, Red Bank, N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Jul. 28, 1977, Ser. No. 819,957

Int. Cl.[2] C07D *307/46*

U.S. Cl. 260—347.2 **8 Claims**

1. A 5-acyl-2-(furfurylthio)dihydro-2,5-dialkyl-3-[2H]furanone having the structure:



wherein R_1', R_2', R_3' and R_4' are the same or different and each represents hydrogen or methyl or mixtures thereof.

4,092,335

DESALANYLTETAINE DERIVATIVES AND THE METHOD FOR THEIR PREPARATION

Wojciech Gruszecki; Edward Bordwski; Jerzy Gumieniak; Malgorzata Gumieniak, all of Gdansk; Maciej Smulkowski, Gdynia; Hanna Wojciechowska, Gdansk, and Miroslaw Bobrowski, Bialystok, all of Poland, assignors to Politechnika Gdanska, Gdansk-Wrzeszcz, Poland

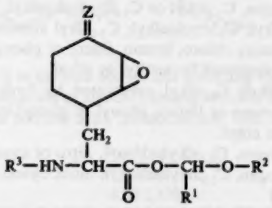
Continuation of Ser. No. 491,651, Jul. 25, 1974, abandoned. This application Nov. 5, 1976, Ser. No. 739,347

Claims priority, application Poland, Jul. 26, 1973, 164319

Int. Cl.[2] C07D *301/00*; A01N *9/00*

U.S. Cl. 260—348.44 **1 Claim**

1. Compounds of the formula



wherein R^1 is hydrogen, R^2 is selected from the group consisting of alkyl of form 1 to 6 carbon atoms, acyl of from 1 to 6 carbon atoms and benzyl, R^3 is selected from the group consisting of hydrogen, α-aminoacyl, acetylaminoacyl, phenoxyacetylaminoacyl, acetyl and substituted acetyl, and Z is oxygen.

4,092,336

DINITROCYANOALKYL EPOXIDES

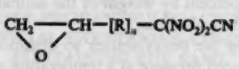
Milton B. Frankel, Tarzana, and Naomi N. Ogimachi, Canoga Park, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 5, 1967, Ser. No. 630,489

Int. Cl.[2] C07D *303/08*

U.S. Cl. 260—348.45 **4 Claims**

1. As compositions of matter, dinitrocyanoalkyl epoxides having the formula:



wherein R is a lower alkylene radical of from 1 to 5, and *n* is 0 or one.

4,092,337

BROMINE SUBSTITUTED CARBOXYLIC ACID ESTERS

Horst Jager, Bettingen, and Peter Rohringer, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

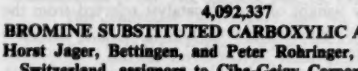
Filed Jun. 30, 1976, Ser. No. 701,457

Claims priority, application Switzerland, Jul. 7, 1975, 8834/75

Int. Cl.² C09F 7/00; C11C 3/00

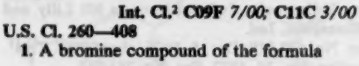
U.S. Cl. 260—408 **9 Claims**

1. A bromine compound of the formula



in which X_1 is alkylene with 2 to 6 carbon atoms, *m, n, p* and *q* each is an integer from 1 to 13, *r* and *s* each is an integer from 1 to 7, at least two of the indices *m, n, p* and *q* are at least 2 and *t* is 1 or 2 and the sum of $m + n + p + q + r + s$ is an integer from 10 to 40.

6. A bromine compound according to claim 1 of the formula



4,092,338

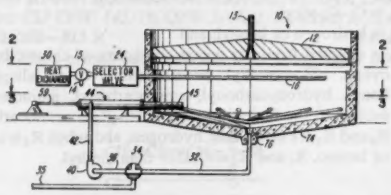
SLUDGE DISTRIBUTION NETWORK

De Fro Tossey, 900 Warrington Pl., Dayton, Ohio 45419

Filed Jan. 27, 1977, Ser. No. 763,050

Int. Cl.² B01D 21/02

U.S. Cl. 210—142 **5 Claims**



1. In a sludge digestion facility of the type in which a body of sludge contained within a tank is digested in said tank by bacteria, said body comprising a plurality of quiescent zones near the bottom of said tank, the improvements including a plurality of pipes mounted within said tank, each pipe having an effluent opening into one of said quiescent zones adjacent the floor of said tank, said openings peripherally disposed and spaced apart within said tank, pump means for pumping partially digested sludge derived from said tank, and valve means in communication with said pump means for distributing said partially digested sludge sequentially to only one of said pipes at a time, and for a period sufficient to enable partially digested sludge emerging from the opening of said one of said pipes into its respective quiescent zone, to substantially entirely displace materials which have settled in said respective quiescent zone during that period when partially digested sludge was not emerging from the opening of said one of said pipes.

5. In a sludge digestion facility of the type in which a body of sludge contained within a tank is digested in said tank by anaerobic bacteria, said body comprising a plurality of quiescent zones near the bottom of said tank, said tank having a discharge port through which partially digested sludge is periodically discharged to make room for incoming new sludge, the improvements including pipes mounted within said tank and having plural effluent openings adjacent the floor of said tank, each of said openings, opening into a respective one of said quiescent zones, a manifold having plural outlet ports each connecting separately to one of said pipes, pump means having communication between said manifold and said discharge port for forcing sludge being discharged from said tank through said manifold, sequential fluid switch means, valve means responsive to said switch means for sequentially distributing sludge forced to said manifold by said pump means through a single one of said outlet ports, into its respective quiescent zone, for a period sufficient to enable sludge emerging from said single one of said ports to substantially entirely displace materials which have settled in said respective quiescent zone during that period when sludge was not emerging from said single one of said ports, each of said effluent openings submerged below the level of sludge residing in said tank.

4,092,339

PROCESS FOR MAKING POLYGLYCIDYL ESTERS

Violete L. Stevens; Arthur R. Sexton, both of Midland, Mich., and Frederick P. Corson, Sudbury, Mass., assignors to The Dow Chemical Company, Midland, Mich.

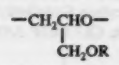
Continuation-in-part of Ser. No. 466,098, May 2, 1974, abandoned. This application Nov. 19, 1975, Ser. No. 633,583

The portion of the term of this patent subsequent to Nov. 4, 1992, has been disclaimed.

Int. Cl.² C09F 5/08

U.S. Cl. 260—410.6 **12 Claims**

1. The process of making a glycidyl ester polymer comprising reacting a carboxylic acid or anhydride with a tert.-alkyl glycidyl ether polymer, comprising units represented by the formula



wherein R is tert.-alkyl, in the presence of a strong acid catalyst wherein the carboxylic acid or anhydride is selected from the group consisting of the polycarboxylic acids, the polycarboxylic acid anhydrides, the saturated fatty acids, the olefinic fatty acids, the aromatic monocarboxylic acids and the chloro- and bromo-analogs of saturated fatty acids, olefinic fatty acids and aromatic monocarboxylic acids.

11. The process of claim 1 wherein the carboxylic acid or anhydride is selected from acetic, butyric, lauric, stearic, acrylic, methacrylic, undecylenic, oleic, linoleic, benzoic, alkylbenzoic and naphthoic acids, chloro- and borom-analogs of the foregoing, succinic, adipic, sebacic, maleic, itaconic, citraconic, glutaconic, phtalic, isophtalic and terephthalic acids and their anhydrides.

4,092,340

PROCESS FOR PREPARING ORGANOTIN COMPOUNDS

Trevor Eric Jones, Halesowen, England, assignor to Albright & Wilson Limited, Warley, England

Filed Jan. 14, 1976, Ser. No. 648,948

Claims priority, application United Kingdom, Jan. 20, 1975, 02456/75

Int. Cl.² C07F 7/22

U.S. Cl. 260—429.7 **28 Claims**

1. A process for preparing a tetraalkyltin compound which comprises passing an alkyl halide of formula RX where R is an alkyl group of 1 to 4 carbon atoms and X is a halogen selected from the group consisting of chlorine, bromine and iodine atoms, into a heated suspension of metallic material selected from the group consisting of (i) a mixture of zinc and tin, and (ii) an alloy consisting essentially of tin and zinc, the atomic proportion of zinc to tin present in the metallic material being

at least 0.5:1, in a liquid at a temperature of 100°–300° C comprising at least one halide selected from the group consisting of organic quaternary ammonium and phosphonium halides and tertiary sulphonium halides, to react said alkyl halide with said metallic material to form the tetraalkyltin which evaporates to produce a vapour effluent comprising the tetraalkyltin compound.

4,092,341

PROCESS OF MAKING AN OIL SOLUTION OF ZINC DIHYDROCARBYLDITHIOPHOSPHATES

Alexander George Lowe, Reading; Philip Edward Derbyshire, Little Sandhurst, near Camberley, both of England, and Andrew George Papay, Manchester, Mo., assignors to Edwin Cooper and Company Limited, Bracknell, England

Filed Feb. 14, 1977, Ser. No. 768,143

Claims priority, application United Kingdom, Feb. 27, 1976, 7853/76

Int. Cl.² C07F 3/06

U.S. Cl. 260—429.9 **4 Claims**

1. In the process of making an oil solution of a zinc dihydrocarbyl dithiophosphates by reacting zinc oxide with a dihydrocarbyldithiophosphoric acid in a mineral oil reaction medium, the improvement comprising reacting said mineral oil with nitrogen dioxide in an amount sufficient to promote the reaction of said zinc oxide with said dihydrocarbyldithiophosphoric acid.

4,092,342

METHOD FOR RECOVERING ALKYLALUMINUM CHLORIDES

Karl Heinz Mueller, Werne, Germany, assignor to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

Filed Feb. 28, 1977, Ser. No. 772,578

Claims priority, application Germany, Jun. 23, 1976, 2628191

Int. Cl.² C07F 5/06

U.S. Cl. 260—448 A **2 Claims**

1. A method for recovering a product which is a dialkylaluminum chloride, an alkylaluminum dichloride, or a mixture thereof wherein said alkyl has from 1 to 6 carbon atoms, said product having a zinc concentration therein of less than 200 ppm, from a mixture of said dialkylaluminum chloride and soluble zinc compounds, which method comprises reacting said mixture with aluminum chloride under an inert atmosphere at a temperature up to about 150° C. and then distilling off said product.

4,092,343

POLYMETHYLENE POLYPHENYL POLYISOCYANATE

Floro F. Frulla, Wallingford; Adnan A. R. Sayigh, North Haven; Henri Ulrich, Northford, and Peter J. Whitman, Hamden, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 598,794, Jul. 24, 1975, Pat. No. 4,039,580. This application May 16, 1977, Ser. No. 797,545

Int. Cl.² C07C 119/048, 118/02

U.S. Cl. 260—453 AM **1 Claim**

1. A polymethylene polyphenyl polyisocyanate which is the product of phosgenation of a mixture of methylene polyphenyl polyamines which contains from about 40 to 60 percent by weight of di(aminophenyl)methanes and which has been obtained by

(a) reacting aniline and formaldehyde in a proportion within the range of 4 moles to 10 moles of aniline per mole of formaldehyde at a temperature of 20° C to 60° C and in the absence of catalyst to form a mixture of aminals;

(b) separating water from said aminals;

(c) contacting the aminals so obtained with at least about 1 percent by weight of a solid catalyst selected from the class consisting of diatomaceous earths, clays, and zeolites at a temperature of about 20° C to about 60° C until from 80 to 100 percent by weight of the aminals has been converted to benzylamines;

(d) subjecting the benzylamines so obtained to distillation under reduced pressure at a temperature not greater than 150° C to remove aniline until the aniline content of the undistilled fraction is within the range of about 3 to 22 percent by weight; and

(e) contacting said undistilled fraction with at least about 1 percent by weight of a solid catalyst selected from the class consisting of diatomaceous earth, clays, and zeolites at a temperature of about 100° C to 190° C until conversion to methylene polyphenyl polyamines is complete.

4,092,344

CYCLOHEXENYL RESORCINOL DERIVATIVES

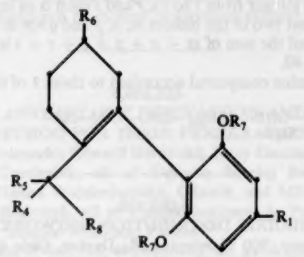
Ken Matsumoto, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 638,019, Dec. 5, 1975, abandoned. This application Jan. 24, 1977, Ser. No. 761,745

Int. Cl.² C07C 39/17, 43/22, 69/76, 121/75

U.S. Cl. 260—465 F **5 Claims**

1. A compound of the formula



wherein:

R_1 is C_5–C_{10} alkyl;

R_4 and R_5 independantly are hydrogen or methyl;

R_6 is C_1–C_4 alkyl;

R_7 is hydrogen or benzyl; and

R_8 is selected from the group consisting of chloro, bromo, cyano, chloromethyl, bromomethyl, C_1–C_3 alkoxycarbonyl, hydroxycarbonyl, aminocarbonyl, aminomethyl, subject to the limitations that when R_8 is aminocarbonyl, R_4 and R_5 are other than hydrogen, and when R_8 is chloro or bromo, R_4 and R_5 are other than methyl.

4,092,345

(CYCLO)ALKYLENEDIAMMONIUM-BIS-TETRAHALOPHTHALATES

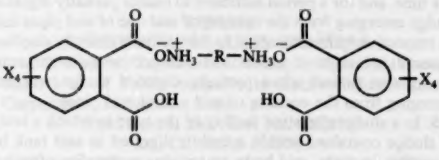
Lionel T. Wolford, Freehold; Chien Yung Lee, Kendall Park, and Anderson O. Dotson, Jr., Somerset, all of N.J., assignors to Cities Service Company, Tulsa, Okla.

Filed Jul. 30, 1976, Ser. No. 709,987

Int. Cl.² C07C 63/12; C09K 3/28

U.S. Cl. 260—501.16 **8 Claims**

1. An alkylene- or cycloalkylenediammonium-bis-tetrahalophthalate corresponding to the formula:



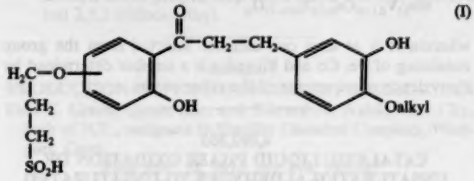
wherein X is halogen and R is an alkylene or cycloalkylene group containing 2–15 carbon atoms.

4,092,346
ACYL-PHENOXY-PROPANESULFOACIDS AND SALTS, AND ARTIFICIAL SWEETENING COMPOSITIONS CONTAINING THE SAME

Lóránd Farkas; Mihály Nógrádi; Tódor Pfliegel; Sándor Antus, and Agnes Gottsegen, all of Budapest, Hungary, assignors to Chinoin Gyógyszer és Vegyészeti Termékek Gyára Rt., Budapest, Hungary

Continuation of Ser. No. 550,659, Feb. 18, 1975, abandoned. This application Dec. 1, 1976, Ser. No. 746,350
Claims priority, application Hungary, Feb. 19, 1974, OE 1448
Int. Cl.[2] C07C *143/24;* A23L *1/236*
U.S. Cl. 260—511 5 Claims

1. A compound of the formula (I),



(I)

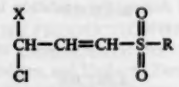
wherein "alkyl" is a C_{1-4} alkyl group or an alkali metal, alkaline-earth metal or ammonium salt thereof.

4,092,347
1-CHLORO-PROP-2-ENE-3-SULFONIC ACID COMPOUNDS AND THEIR MANUFACTURE

Walter Schenk, Bad Durkheim; Helmut Schlecht, Ludwigshafen, and Guenther Gotsmann, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Sep. 23, 1976, Ser. No. 725,846
Claims priority, application Germany, Oct. 11, 1975, 2545660
Int. Cl.[2] C07C *143/16;* C07F *3/06, 3/10;* C25D *3/12*
U.S. Cl. 260—513 R 4 Claims

1. 1-Chloro-prop-2-ene-3-sulfonic acid compounds of the formula



where X is hydrogen or chlorine, R is hydroxyl or —OY and Y is one equivalent of nickel, cobalt, cadmium, zinc, mercury, sodium, potassium, calcium or magnesium.

4,092,348
OCTASODIUM-1,1,2,2,4,4,5,5-CYCLOHEXANE OCTACARBOXYLATE AND COMPOSITIONS AND METHODS EMPLOYING SAME

Marvin M. Crutchfield, St. Louis County, and Charles J. Upton, Ballwin, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 3, 1977, Ser. No. 774,171
Int. Cl.[2] C07C *61/08*
U.S. Cl. 260—514 K 2 Claims

1. Compounds having the molecular structure represented by the formula:

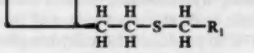
wherein X = COOM, where M is alkali metal ammonium or trialkanolamine.

4,092,349
11-DESOXY-15-THIAPROSTAGLANDINS

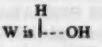
Jacob J. Plattner, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Nov. 10, 1976, Ser. No. 740,381
Int. Cl.[2] C07C *149/40;* A61K *31/19*
U.S. Cl. 260—516 4 Claims

1. An optically active compound of the formula



and the enantiomer and racemate thereof wherein:
Q is $—COOR_2$;
U is ethylene or cis vinylene



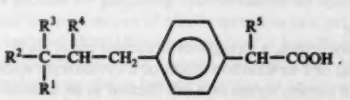
or oxygen;
R_1 is selected from the group consisting of phenyl and monosubstituted phenyl, said substituent being selected from the group consisting of fluoro, chloro, methyl, methoxy and trifluoromethyl;
R_2 is selected from the group consisting of hydrogen and alkyl having one to four carbon atoms;
or a pharmaceutically acceptable alkali metal, alkaline earth metal or ammonium salt of said compound.

4,092,350
ALKANOIC ACID, PROCESS FOR ITS PRODUCTION AND METHOD OF USE THEREOF

Koji Miura, Kanazawa; Kenjun Takeshima, Nyuzen; Takuya Kodama, Uozu; Masashi Imamura, Toyama; Kyoko Hongo, Toyama; Noboru Takagawa, Toyama; Yukitaka Hamatani, Toyama, and Yasuyuki Suzuki, Toyama, all of Japan, assignors to Toyama Chemical Company Limited, Tokyo, Japan

Filed Apr. 14, 1976, Ser. No. 677,092
Claims priority, application Japan, Apr. 23, 1975, 50-48593
Int. Cl.[2] C07C *65/02;* A61K *31/19*
U.S. Cl. 260—521 R 8 Claims

1. A compound represented by the general formula:



wherein R^1 represents hydrogen; R^2 represents hydroxy; R^3 represents lower alkyl; R^4 represents hydrogen or lower alkyl;

and R^5 represents lower alkyl; wherein lower alkyl has 1 - 5 carbon atoms; or a non-toxic salt thereof.

4,092,351

METHOD OF SYNTHESIS OF 4,5,6-TRIHYDROXYISOPHTHALIC ACID

Mohammed T. Shipchandler, Terre Haute, Ind., assignor to IMC Chemical Group, Inc., Terre Haute, Ind.

Division of Ser. No. 658,422, Feb. 17, 1976, Pat. No. 4,046,817, which is a continuation-in-part of Ser. No. 490,156, Jul. 19, 1974, abandoned. This application May 25, 1977, Ser. No. 800,382

Int. Cl.² C07C 65/02

U.S. Cl. 260—521 P 5 Claims

1. A process for the production of 4,5,6-trihydroxyisophthalic acid comprising the steps of

(a) reacting dialkyl glutarate with dialkyl dialkoxymalonate said alkyl and alkoxy groups having from 1–6 carbon atoms in about a 1 to 1–2 mole ratio at a temperature of 25°–150° in the presence of a condensation-promoting sodium hydride or a sodium alkoxide catalyst thereby producing dialkyl 4,6-dihydroxy-5,5-dimethoxy-3,6-cyclohexadiene-1,3-dicarboxylate

(b) heating said dialkyl 4,6-dihydroxy-5,5-dimethoxy-3,6-cyclohexadiene-1,3-dicarboxylate in the presence of a strong acid selected from the group consisting of sulfuric, hydrochloric, hydrobromic, trichloroacetic, and p-toluene sulfonic acids at a temperature of from about 30° to about 150° C to produce 4,5,6-trihydroxyisophthalic acid.

4,092,352

2,3-DICHLORO-4-HYDROXY-BENZOIC ACID AND PROCESS FOR PREPARATION THEREOF

Charles E. Berkoff, Huntingdon Valley, and Robert Lee Webb, West Chester, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Oct. 4, 1976, Ser. No. 729,329

Int. Cl.² C07C 65/04

U.S. Cl. 260—521 H 2 Claims

1. The method of preparing 2,3-dichloro-4-hydroxybenzoic acid comprising reacting 2,3-dichlorophenol with an excess of carbon tetrachloride in the presence of an aqueous alkali metal hydroxide and copper powder at reflux until the reaction is completed.

4,092,353

PROCESS FOR THE PURIFICATION OF BENZOIC ACID

Wilhelm Wolf, Krefeld, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jul. 29, 1977, Ser. No. 820,516

Claims priority, application Germany, Aug. 13, 1976, 2636489

Int. Cl.² C07C 51/42

U.S. Cl. 260—525 7 Claims

1. A process for purifying benzoic acid which comprises contacting benzoic acid with an amine of the formula

$$H_2N - R$$

wherein

R is hydrogen, a straight or branched chain alkyl radical of 1 to 4 carbon atoms or a cycloalkyl radical with 5 to 6 carbon atoms or a salt thereof in an amount of 0.004 to 0.01 mol per mol of benzoic acid

at a temperature of 100° C to 250° C and distilling over or subliming benzoic acid from the resultant mixture.

4,092,354

PROCESS FOR PRODUCTION OF ACRYLIC ACID

Tatsuo Shiraishi; Susumu Kishiwada, and Yoshihiko Nagaoka, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed Mar. 29, 1974, Ser. No. 456,270

Claims priority, application Japan, Mar. 30, 1973, 48-36925

Int. Cl.² C07C 51/32

U.S. Cl. 260—530 N 10 Claims

1. A process for the production of acrylic acid by the gas phase catalytic oxidation of acrolein with molecular oxygen which comprises contacting a gaseous mixture comprising acrolein and molecular oxygen with a catalyst consisting essentially of a metal oxide composition having the formula:

$$Mo_{12}V_{0.1-16}Cu_{0.1-8}X_{0.01-12}O_a$$

wherein X is at least one member selected from the group consisting of Fe, Co and Ni and *a* is a number determined by the valence requirements of the other atoms.

4,092,355

CATALYTIC LIQUID PHASE OXIDATION OF UNSATURATED ALDEHYDES TO UNSATURATED CARBOXYLIC ACIDS

John Joseph Leonard, Springfield, Pa., and Jar-Lin Kao, Cherry Hill, N.J., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Feb. 7, 1977, Ser. No. 766,097

Int. Cl.² C07C 51/32, 57/04, 57/06, 57/08

U.S. Cl. 260—530 N 10 Claims

1. A process for the liquid phase oxidation of an α,β-unsaturated aliphatic aldehyde containing from 3 to 6 carbon atoms in an inert solvent solution to the corresponding unsaturated aliphatic carboxylic acid which comprises contacting said aldehyde with oxygen or an oxygen-containing gas at a temperature of from about 0° C. to 100° C. and a pressure between about atmospheric and 1500 psig in the presence of from about 0.00001 to 0.5 mole of an antimony salt catalyst selected from the group consisting of antimony pentachloride, antimony tartrate, triphenyl antimony chloride, antimony sulfate, antimony pentafluoride, antimony pentoxide, antimony trichloride, antimony trifluoride, antimony oxide, antimony potassium tartrate, antimony nitrate, trimethyl stibine and triphenyl stibine or mixtures thereof, per mole of said aldehyde to effect an in situ decomposition of intermediate peroxide compounds formed during the oxidation to said unsaturated aliphatic carboxylic acid.

4,092,356

11,12-SECOPROSTAGLANDINS

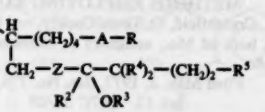
Edward J. Cragoe, Jr.; John B. Bicking, and Robert L. Smith, all of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 669,118, Mar. 22, 1976, Pat. No. 4,066,692, which is a continuation-in-part of Ser. No. 571,038, Apr. 23, 1975, abandoned, which is a continuation-in-part of Ser. No. 389,901, Aug. 23, 1973, abandoned, which is a continuation-in-part of Ser. No. 302,265, Oct. 30, 1972, abandoned. This application Dec. 17, 1976, Ser. No. 751,510

Int. Cl.² C07C 59/00

U.S. Cl. 260—535 R 18 Claims

1. The compound having the following formula:



wherein R is carboxy, a carboxy salt, or derivatized carboxy having the formula —COOY wherein Y is alkyl having 1–10

carbon atoms, 1-succinimidoethyl, 1-(pivaloyloxy)ethyl, 2-acetamidoethyl, or diloweralkylamino-loweralkyl;

A is oxymethylene;

R^1 is formyl, acetyl, propionyl, acryloyl, hydroxyacetyl, 3-hydroxypropionyl, hydroxymethyl, 1-hydroxyethyl, 1,2-dihydroxyethyl, 1,3-dihydroxypropyl, or 1-hydroxy-1-methylethyl;

Z is methylene, ethylene, trimethylene, tetramethylene, vinylene, or ethynylene;

R^2 is independently hydrogen or methyl;

R^3 is hydrogen;

R^4 is selected independently from the group consisting of hydrogen and methyl; and

R^5 is selected from the group consisting of hydrogen, lower alkyl of 1–4 carbon atoms either straight or branched (e.g., methyl, ethyl, propyl, isopropyl, butyl, tert-butyl), vinyl, and 2,2,2-trifluoroethyl.

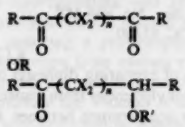
4,092,357

PRODUCTION OF PERCHLOROMETHYL MERCAPTAN

Carl C. Greco, Garnerville, and Edward N. Walsh, New City, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 22, 1976, Ser. No. 753,133
Int. Cl.[2] C07C *145/00*
U.S. Cl. 260—543 H **8 Claims**

1. In a method for producing perchloromethyl mercaptan via the catalytic reaction of chlorine and carbon disulfide, the improvement which comprises contacting the reactants with difunctional carbonyl compounds having the following structure:



OR

wherein R independently is a hydrocarbyl, alkoxy, or substituted hydrocarbyl group; R′ independently is an alkyl group or hydrogen; and X independently is hydrogen or a halogen; and *n* is an integer varying from 0 to 3, wherein said carbonyl compounds are added in amounts effective to suppress the formation of carbon tetrachloride and sulfur monochloride.

4,092,358

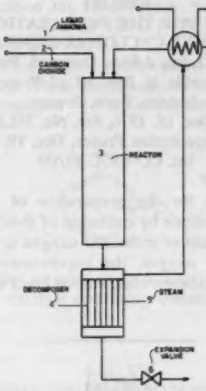
PROCESS FOR THE PRODUCTION OF UREA HAVING A LOW CARBAMATE CONTENT

Mario Guadalupi, Milan, and Umberto Zardi, San Donato Milanese, both of Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Continuation of Ser. No. 529,120, Dec. 3, 1974, abandoned, which is a division of Ser. No. 260,339, Jun. 6, 1972, Pat. No. 3,876,696, which is a continuation of Ser. No. 756,845, Sep. 3, 1968, abandoned. This application Oct. 18, 1976, Ser. No. 733,716
The portion of the term of this patent subsequent to Apr. 8, 1992, has been disclaimed.
Int. Cl.[2] C07C *126/00*
U.S. Cl. 260—555 A **4 Claims**

1. In a process for the production of urea which comprises feeding carbon dioxide and an excess of ammonia to a synthesis zone at temperatures from 150° to 350° C and at pressures from 100 to 300 atmospheres, reacting the carbon dioxide and ammonia therein at an ammonia/carbon dioxide mole ratio of from 2.3:1 to 5.5:1 to produce, as the reaction product, a solution of urea contaminated with ammonium carbamate and containing the excess ammonia, passing said solution directly into a decomposer having a pressure lower than the pressure in said synthesis zone, withdrawing gaseous carbon dioxide and ammonia from the upper part of the decomposer, recycling said gaseous carbon dioxide and ammonia as well as the excess ammonia to the synthesis zone as a liquid and recovering the urea solution;

the improvement which comprises allowing said solution which passes into the decomposer to flow as a thin liquid film over a surface heated to an extent sufficient to cause



at least a part of the ammonium carbamate to decompose into gaseous carbon dioxide and ammonia wherein only decomposition products carbon dioxide and ammonia and excess ammonia, materials formed or contained in the decomposer, are recycled to the synthesis zone.

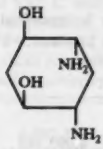
4,092,359

PROCESS FOR THE PREPARATION OF 2,5-DIDEOXYSTREPTAMINE AND OF A NOVEL INTERMEDIATE THEREFOR

Peter J. L. Daniels, Cedar Grove, and Mohammad Mehdi Nafissi Varchei, North Caldwell, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Feb. 15, 1974, Ser. No. 443,051
Int. Cl.[2] C07C *91/14*
U.S. Cl. 260—563 R **5 Claims**

1. 2,5-dideoxystreptamine of the formula



and an acid-addition salt thereof.

4,092,360

PRODUCTION OF CYCLOHEXANONE

Jan F. Van Peppen, and William Bernard Fisher, both of Chester, Va., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed May 4, 1977, Ser. No. 793,563
Int. Cl.[2] C07C *37/38, 45/00*
U.S. Cl. 260—586 P **10 Claims**

1. In a process for preparing cyclohexanone by hydrogenating phenol in the presence of a hydrogenation catalyst using as starting material phenol having a purity of at least 99.8 percent obtained from distillation of cumene hydroperoxide decomposition product containing hydroxyacetone as an impurity, the improvement which comprises reducing the hydroxyacetone content of the phenol to a level less than 75 ppm by weight by heating the phenol for at least one minute at a temperature of

40° C. to 220° C. with 0.01 to 2 percent by weight of a polyethylenimine having a molecular weight of about 1,000 to 100,000 and distilling the mixture formed to separate the phenol.

4,092,361

PROCESS FOR THE PREPARATION OF 3,5,5-TRIMETHYL-CYCLOHEX-2-ENE-1,4-DIONE

Michel Costantini, Lyon; Adrien Dromard, Paris, and Michel Jouffret, Francheville le Bas, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Dec. 16, 1976, Ser. No. 751,159
Claims priority, application France, Dec. 19, 1975, 75 39783
Int. Cl.² C07C 45/00
U.S. Cl. 260—586 P 10 Claims

1. In a process for the preparation of 3,5,5-trimethyl-cyclohex-2-ene-1,4-dione by oxidation of β-isophorone in the liquid phase by means of molecular oxygen or of a gas which contains molecular oxygen, the improvement consisting of carrying out said oxidation using carbon black as catalyst in the presence of a base.

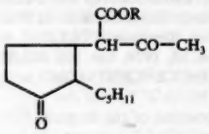
4,092,362

PROCESS FOR THE PREPARATION OF 2-N-PENTYL-3-(2-OXOPROPYL)-1-CYCLOPENTANONE

Charles Celli, 70 rue d'Enghein, Eaubonne, France

Division of Ser. No. 283,078, Aug. 23, 1972, abandoned. This application Dec. 13, 1976, Ser. No. 749,691
Claims priority, application France, Sep. 1, 1971, 71.31578
Int. Cl.² C07C 45/00
U.S. Cl. 260—586 R 6 Claims

1. A process for the production of 2-n-pentyl-3-(2-oxopropyl)-1-cyclopentanone, which comprises hydrolysing and decarboxylating a compound of the formula



I

wherein R represents a hydrocarbyl group, at an elevated temperature and under pressure with water in an initially substantially neutral medium.

4,092,363

PRODUCTION OF DIALKYLPHOSPHINE OXIDES

Horst Staendeke, Bruhl, and Hubert Neumaier, Hurth, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Sep. 30, 1976, Ser. No. 728,234
Claims priority, application Germany, Oct. 6, 1975, 2544606
Int. Cl.² C07F 9/53
U.S. Cl. 260—606.5 P 7 Claims

1. In a process for making dialkylphosphine oxides of the general formula:

in which R^1 and R^2 each stand for an alkyl group having from 1 to 4 carbon atoms by subjecting a dialkylchlorophosphine of the general formula:

in which R^1 and R^2 have the meanings given above, an addition product thereof with hydrogen chloride or mixture thereof, to alcoholysis with an aliphatic C_1 – C_4 alcohol in the presence of a protective gas at temperatures between −30° and +30° C, and subjecting the resulting alcoholysate to thermolysis, the improvement which comprises:

continuously adding the dialkylchlorophosphine component to the alcohol; subjecting the resulting alcoholysate to thermolysis in a heated separation zone; introducing into the separation zone, countercurrently to the alcoholysate, 10 to 150 l/h of a protective gas, per liter of alcoholysate; removing simultaneously from the separation zone the gaseous thermolysis products and, separately from said products, an alcoholic solution containing desirable final product; neutralizing the alcoholic solution and recovering the final product from said solution.

4,092,364

CAUSTIC HYDROLYSIS OF CHLOROBENZENE TO DIPHENYL OXIDE

William E. Smith, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 14, 1976, Ser. No. 696,155
Int. Cl.² C07C 41/00
U.S. Cl. 260—612 R 4 Claims

1. In the noncatalytic process of preparing diphenyl oxide, biphenylylphenyl ethers and phenylphenols from caustically hydrolyzing chlorobenzene at a temperature between about 350° C and about 450° C and at high pressure wherein phenol is a by-product, the caustic and chlorobenzene present at a caustic:chlorobenzene mole ratio between about 0.75:1 and about 3.5:1 the improvement comprising: recycling the phenol such that the phenol and chlorobenzene are present at a phenol:chlorobenzene mole ratio between about 0.1:1 and about 2.5:1 and that a net phenol of zero or less is achieved.

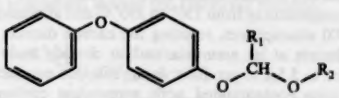
4,092,365

DIPHENYL ETHER ACETALS

Saleem Farooq, Aesch, and Friedrich Karrer, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 2, 1976, Ser. No. 654,263
Claims priority, application Switzerland, Feb. 7, 1975, 1550/75; Dec. 12, 1975, 16152/75
The portion of the term of this patent subsequent to May 18, 1993, has been disclaimed.
Int. Cl.² C07C 43/22
U.S. Cl. 260—613 R 4 Claims

1. A compound of the formula I



wherein

R_1 represents hydrogen or C_1–C_3-alkyl, and

R_2 represents C_1–C_4-alkyl, C_1–C_3-halogenoalkyl, C_3–C_4-alkenyl or C_3–C_4-alkynyl.

4,092,366

SYNTHESIS OF VITAMIN A, INTERMEDIATES AND CONVERSION THEREOF TO VITAMIN A

William Oroshnik, Plainfield, N.J., assignor to SCM Corporation, New York, N.Y.

Continuation of Ser. No. 566,981, Apr. 10, 1975, Pat. No. 4,035,425, which is a division of Ser. No. 353,215, April 23, 1973, Pat. No. 3,949,006, which is a continuation-in-part of Ser. No. 246,939, Apr. 24, 1972, abandoned. This application Mar. 1, 1976, Ser. No. 662,334

Int. Cl.[2] C07C *29/00*

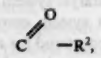
U.S. Cl. 568—824 1 Claim

1. A process for synthesizing Vitamin A from beta-ionone which comprises:

(a) ethynylating beta-ionone to form ethynyl-beta-ionol;

(b) etherifying the hydroxyl group of said ionol at the tertiary carbon atom to form a compound having an OR group at the tertiary carbon atom, R being lower alkyl, lower alkenyl, phenyl or aralkyl;

(c) coupling the product of step (b) with an isoprene unit having a terminal OR^1 group in the 4-position, R^1 being hydrogen or



R^2 being lower alkyl, phenyl, or aralkyl, to form a substituted 10,11-didehydro-9,12-dihydroretinol in which the number 12 carbon atom constitutes a potentially active prototropic center;

(d) hydrogenating said reaction product to convert the acetylenic bond thereof to an ethylenic bond; and

(e) inducing a prototropic reaction with the removal of hydrogen from carbon number 12 and OR from carbon number 9 and rearranging the sites of unsaturation to provide the Vitamin A structure;

(f) said protrotropic reaction being carried out in the presence of a strong, basic medium.

4,092,367

ALKYLATION OF PHENOLS

Billy W. Bridwell, Rosenberg, Tex., and Carl E. Johnson, Brookhaven, Miss., assignors to Nalco Chemical Co., Oak Brook, Ill.

Filed Sep. 3, 1976, Ser. No. 720,178

Int. Cl.[2] C07C *39/06*

U.S. Cl. 568—785 7 Claims

1. A process of preparing an alkylated phenol which is substantially monoalkylated and para oriented which comprises reacting phenol with a C_4–C_9 mono-unsaturated non-aromatic olefin, said olefin being utilized in about 5–10% stoichiometric excess and wherein the reaction temperature utilized is about 60°–105° C for at least about 30 minutes in the presence of a catalyst consisting of anhydrous H_3PO_4 in the range 8–25% anhydrous H_3PO_4 by weight based on the weight of phenol and producing a C_4–C_9 alkylated phenol in a favorable product ratio which is substantially para oriented.

4,092,368

VAPOR PHASE TRANSESTERIFICATION

William E. Smith, Schenectady, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Mar. 13, 1974, Ser. No. 450,588

Int. Cl.[2] C07C *29/00, 27/00*

U.S. Cl. 568—877 2 Claims

1. A vapor phase process for preparing an allylic alcohol which comprises reacting an allylic ester of a lower alkyl carboxylic acid selected from the group consisting of allyl acetate, methallyl acetate or crotyl acetate with methanol in the presence of a zeolite transesterification catalyst at a temperature of from about 150° C to about 300° C.

4,092,369

PROCESS FOR THE PREPARATION OF CHLOROALKYLBENZENE CHLORIDES

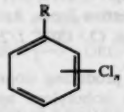
Samuel Gelfand, Lewiston, N.Y., assignor to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Continuation of Ser. No. 547,079, Feb. 4, 1975, abandoned. This application Jul. 12, 1976, Ser. No. 704,729

Int. Cl.[2] C07C *17/14*

U.S. Cl. 260—651 R 23 Claims

1. A process for the mono-αchlorination of alkyl chloroaromatic compounds which comprises reacting chlorine with an alkyl chloroaromatic compound of the formula:



where R is methyl or ethyl and *n* is 1 or 2; in the presence of a pre-prepared catalyst consisting essentially of an organic sulfide.

4,092,370

PROCESS FOR PRODUCING TETRACHLOROETHYLENE FROM TETRACHLOROMETHANE USING A MOLTEN SALT CATALYST

Eiichi Ichiki; Kazuo Iida; Satoshi Kamata, and Yoshinori Kobayashi, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 289,039, Sep. 14, 1972, abandoned. This application Sept. 30, 1975, Ser. No. 620,009

Claims priority, application Japan, Sep. 27, 1971, 46–75577; Sep. 30, 1971, 46–76872

Int. Cl.[2] B01J *23/08;* C07C *17/00, 17/04, 17/20*

U.S. Cl. 260—658 R 9 Claims

1. A process for producing tetrachloroethylene which comprises contacting a feed material selected from the group consisting of (1) tetrachloromethane; (2) tetrachloromethane; and a chlorinatable material; (3) tetrachloromethane; a chlorinatable material; and oxygen and (4) tetrachloromethane; a chlorinatable material; oxygen; and hydrogen chloride, chlorine, or a mixture of hydrogen chloride and chlorine; at a temperature of from about 430° C to 650° C with a salt catalyst which is molten at the reaction temperature, said molten salt catalyst consisting essentially of a mixture of a copper chloride and at least one chloride of an alkali metal or an alkaline earth metal, and recovering the tetrachloroethylene.

4,092,371

PROCESS FOR MANUFACTURING A CATALYST COMPRISING ALUMINUM OXIDE AND BORON OXIDE, THE RESULTING CATALYST AND THE USE THEREOF IN ALKYLATION REACTIONS

Jean-Pierre Franck, Bougival, and Jean-Francois Le Page, Rueil-Malmaison, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Division of Ser. No. 699,454, Jun. 24, 1976, This application Jul. 7, 1977, Ser. No. 815,350

Claims priority, application France, Jun. 25, 1975, 75 20198

Int. Cl.[2] C07C *3/52*

U.S. Cl. 260—671 C 11 Claims

1. In the alkylation of an aromatic hydrocarbon with an olefin at about 100–300° C. and under sufficient pressure to maintain the aromatic hydrocarbon in the liquid phase and wherein the proportion of the olefin to the aromatic hydrocarbon is about 0.1 : 1 to 1 : 1, in contact with a catalyst, the improvement wherein said catalyst is that catalyst produced by reacting an aluminum compound of the formula $AlX_yR(3-y)$ where X is halogen, R is a hydrocarbon radical and *y* is 1, 3/2, or 2, with a carrier consisting essentially of a mixture of alumi-

num oxide and boron oxide in proportions by weight of 1 : 0.01 to 1 : 1, respectively, and wherein the compound of formula $AlX_yR_{(3-y)}$ is used in a sufficient amount to introduce 0.5 - 20% by weight of halogen into the catalyst.

4,092,372

CATALYST FOR THE PRODUCTION OF ISOPRENE

Itsuo Furuoya, Suita; Atsuo Kobayashi, Nishinomiya, and Katsuhiko Ogino, Minoo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 564,893, Apr. 3, 1975, abandoned. This application Apr. 6, 1976, Ser. No. 674,730
Claims priority, application Japan, Apr. 3, 1974, 49-38338
Int. Cl.[2] C07C *1/20*
U.S. Cl. 260—681 4 Claims

1. In a method for producing isoprene through catalytic condensation between isobutylene and formaldehyde, the improvement according to which there is employed as the catalyst a solid catalyst comprising silver ion supported on silicon oxide and stabilized by the presence of aluminum oxide, said catalyst being prepared by mixing (1) a silver ammine complex ion, (2) silcon oxide or a silicon compound which is converted to silicon oxide by calcination, and (3) aluminum oxide or an aluminum compound which is converted to aluminum oxide by calcination, and calcining the resultant mixture, the said catalyst having an atomic ratio of aluminum to silver of about 10:1 to about 1:1, and an atomic ratio of silver to silicon of from 1.215:1000 to 7.13 to 100.

4,092,373

POWDER PAINT WITH EPOXY COPOLYMER WITH ANHYDRIDE AND HYDROXY ACIDS

Elaine C. Siwiec, Inkster; Henk Van Oene, Detroit, and Ares N. Theodore, Farmington, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 394,878, Sep. 6, 1973, abandoned. This application Feb. 24, 1975, Ser. No. 552,079
Int. Cl.[2] C08L *63/10*
U.S. Cl. 260—830 R 2 Claims

1. In a thermosettable powder paint which exclusive of pigments, catalysts, antistatic agents, plasticizers, and flow control agents, the same being conventional non-reactive additives to a thermosettable powder paint, consists essentially of a coreactive particulate mixture of

(1) an epoxy-functional copolymer of about 5 to about 20 weight percent of a glycidyl ester of a monoethylenically unsaturated acid and about 95 to about 80 weight percent of monoethylenically unsaturated monomers consisting essentially of monofunctional monomers selected from the group consisting of esters of a $C_1 - C_8$ monohydric alcohol and acrylic acid, esters of a $C_1 - C_8$ monohydric alcohol and methacrylic acid and $C_8 - C_{12}$ monovinyl hydrocarbons, and having a glass transition temperature in the range of 40° C. to about 90° C. and a molecular weight (M_n) in the range of about 1,500 to about 15,000, and

(2) an anhydride crosslinking agent selected from the group consisting of

(a) monomeric anhydrides of dicarboxylic acids, and

(b) homopolymers of monomeric anhydrides of dicarboxylic acids, and

present in an amount that provides about 0.3 to about 1.2 anhydride groups for each epoxy group on said copolymer,

the improvement which comprises having in admixture with said copolymer and said anhydride crosslinking agent a hydroxy carboxylic acid having a melting point in the range of about 40° C. to about 150° C. in an amount such as to provide about 0.1 to about 0.4 carboxyl groups per epoxy group in said copolymer.

4,092,374

ANAEROBIC PRESSURE SENSITIVE ADHESIVE COMPOSITION

Maurice Douek, Beverly Hills; Gustav A. Schmidt, South Pasadena, both of Calif.; Bernard M. Malofsky, Bloomfield, and Martin Hauser, West Hartford, both of Conn., assignors to Avery Products Corporation, San Marino, Calif. and Loctite Corporation, Newington, Conn., a part interest to each

Division of Ser. No. 443,223, Feb. 19, 1974, Pat. No. 3,996,308. This application Sep. 17, 1976, Ser. No. 724,149
Int. Cl.[2] C08L *67/00*
U.S. Cl. 260—873 12 Claims

1. A curable, essentially solvent free anaerobic pressure sensitive adhesive composition comprising a mixture of:

(a) about 35 to about 99 percent by weight of an anaerobic resin system which is stable in the presence of oxygen and which contains at least one anaerobically curable resin having at least one polymerizable acrylate ester moiety;

(b) about 1 to about 65 percent by weight of a polyester thermoplastic system capable of combining a substantial quantity of said anaerobic resin system;

(c) about 0.5 to about 20 percent, based on the total weight of (a) and (b), of a catalyst system for said anaerobic resin system, said catalyst system comprising a peroxy compound, an organic compound for accelerating cure of said anaerobic resins system and a stabilizer for said anaerobic resin system,

said anaerobic pressure sensitive adhesive, when in an essentially solvent-free state, being permanently tacky at room temperature and having a static shear strength of at least about 2 minutes at a 250 gram load per 0.25 square inch and a 180° peel value of at least about 0.5 lb. per inch, and curable upon substantial exclusion of oxygen.

4,092,375

PREPARATION OF A NON-LINEAR ELASTOMERIC COPOLYMER

Arie D. Vreugdenhil, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 3, 1975, Ser. No. 619,542
Int. Cl.[2] C08F *297/04*
U.S. Cl. 260—876 B 11 Claims

1. A process for the preparation of a non-linear, elastomeric copolymer, which comprises:

(a) polymerizing a conjugated diene in the presence of a polyvinylarene lithium compound, A-Li, in which A indicates a polymerized monovinylarene block, having an average molecular weight between 5000 and 35000, so as to form a block copolymer A-B-Li, in which block B substantially comprises polymerized, conjugated diene molecules and in which block A–B has an LVN between 0.1 and 10 dl/g;

(b) polymerizing a conjugated diene in the presence of an alkyllithium initiator, R-Li, R being an alkyl group, so as to form a polymer block B'-Li, block B' having an LVN between 0.1 and 10 dl/g, and the molar ratio X between the initiator R-Li and the compound A-Li being at least 2.5;

(c) coupling the mixture of polymer blocks A-B-Li and B'-Li obtained by the polymerizations mentioned sub (a) and (b) with a coupling agent C which is at least trifunctional in so far as its coupling activity is concerned.

4,092,376

ANAEROBIC PRESSURE SENSITIVE ADHESIVE COMPOSITION

Maurice Douek, Beverley Hills; Gustav A. Schmidt, South Pasadena, both of Calif.; Bernard M. Malofsky, Bloomfield, and Martin Hauser, West Hartford, both of Conn., assignors to Avery Products Corporation, San Marino, Calif. and Loctite Corporation, Newington, Conn.

Division of Ser. No. 443,223, Feb. 19, 1974, Pat. No. 3,996,308. This application Sep. 17, 1976, Ser. No. 724,147

Int. Cl.[2] C08L *27/06, 29/10, 31/04*

U.S. Cl. 260—884 **12 Claims**

1. A curable, essentially solvent free anaerobic pressure sensitive adhesive composition comprising a mixture of:

(a) about 35 to about 99 percent by weight of an anaerobic resin system which is stable in the presence of oxygen and which contains at least one anaerobically curable resin having at least one polymerizable acrylate ester moiety;

(b) about one to about 65 percent by weight of a thermoplastic polymer system containing at least one high molecular weight polymer selected from the group consisting of polyvinyl chloride, polyvinyl ethers and polyvinyl acetates, capable of combining a substantial quantity of said anaerobic resin system;

(c) about 0.5 to about 20 percent, based on the total weight of (a) and (b), of a catalyst system for said anaerobic resin system, said catalyst system comprising a peroxy compound, an organic compound for accelerating cure of said anaerobic resin system and a stabilizer for said anaerobic resin system,

said anaerobic pressure sensitive adhesive, when in an essentially solvent-free state, being permanently tacky at room temperature and having a static shear strength of at least about two minutes at a 250 gram load per 0.25 square inch and a 180° peel value of at least about 0.5 lb. per inch, and curable upon substantial exclusion of oxygen.

4,092,377

PROCESS FOR PREPARING POLYALKYLENE GLYCOL ALKYL OR HALOALKYL POLYPHOSPHONATES

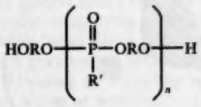
Kyung S. Shim, Irvington, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 501,907, Aug. 30, 1974, abandoned, which is a division of Ser. No. 282,642, Aug. 21, 1972, Pat. No. 3,824,926. This application Nov. 17, 1976, Ser. No. 742,500

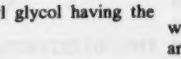
Int. Cl.[2] C07F *9/40*

U.S. Cl. 260—969 **7 Claims**

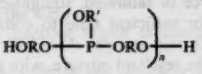
1. The process of preparing a polyalkylene glycol alkyl or haloalkyl polyphosphonate composition characterized by an acid number in water of below about 15 mg. of KOH per gram of sample and having the formula:



wherein R is the residue of a polyalkyl glycol having the formula:

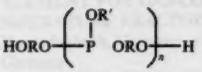


wherein R″ is an alkylene radical of 2 to 20 carbon atoms and x is number from 2 to about 20, R′ is alkyl or haloalkyl and n is a number in the range from about 2 to about 50 comprising heating a polyalkylene glycol alkyl or haloalkyl polyphosphite of the formula:

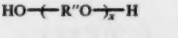


wherein R, R′ and n are as defined above in the presence of a catalytically effective amount of an Arbusov rearrangement catalyst at a temperature in the range from about 160° to 230° C.

5. A process for the preparation of polyalkylene glycol alkyl or haloalkyl polyphosphite having the formula:

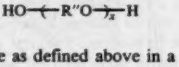


wherein R is the residue of a polyalkylene glycol having the formula:



wherein R″ is an alkylene radical of 2 to 20 carbon atoms and x is a number from 2 to about 20, R′ is alkyl or haloalkyl and n is a number in the range from about 2 to about 50 which consists of transesterifying a tertiary phosphite having the formula:

wherein R′ is as defined above with a polyalkylene glycol having the formula:



wherein R″ and x are as defined above in a mole ratio from about 0.8 to 1 to about 1.5 to 1 at a temperature from about 20° to about 150° C.

4,092,378

METHOD OF REFINING PHOSPHATE-ESTER FLUIDS

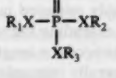
Robert A. Damiani, 6 N 022 Briarwood Dr., St. Charles, Ill. 60174, and P. Dwaine Fowlkes, 702 Elm, Glen Ellyn, Ill. 60137

Filed Mar. 10, 1976, Ser. No. 665,538

Int. Cl.[2] C07F *9/11, 9/12, 9/17, 9/18*

U.S. Cl. 260—990 **10 Claims**

1. In a process of refining phosphate-ester fluids to remove tramp oil and partial acid ester contaminants of such fluids, said phosphate-ester fluids being of the formula:



wherein R_1, R_2 and R_3 individually represent an alkyl group, an aryl group, an alkylaryl group, an arylalkyl group, an ankoxyalkyl group, an alkoxyaryl group, a haloaryl group, a haloalkyl group, a nitroalkyl group, a nitroaryl group, a cyanoaryl group, a haloalkylaryl group or an alkylthioalkyl group; wherein Y represents oxygen or sulfur; and wherein X represents oxygen, sulfur or a carbon-phosphorus bond, at least one of X being oxygen or sulfur, wherein the improvement comprises the steps of: contacting a quantity of a contaminated phosphate-ester fluid with a caustic material to adjust the pH

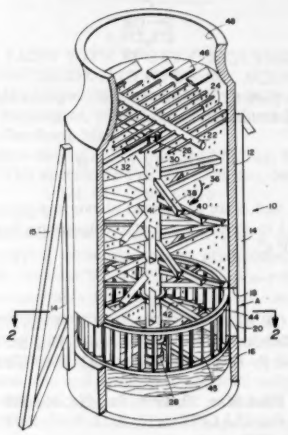
of said fluid to at least about 8.0; contacting resultant alkaline fluid with a source of saturated, straight-chain hydrocarbon liquid material for sufficient time to combine said organic contaminants with said straight-chain hydrocarbon material; adding water to the resultant mixture, with agitation; allowing the water-mixture to stand without agitation to separate three distinct liquid phases consisting essentially of a water phase containing metal salts of partial ester, a straight-chain hydrocarbon material phase containing organometallic complexes of partial ester, and a phase comprising purified phosphate-ester fluid; and separating the purified phosphate-ester fluid phase from the other said phases.

4,092,379

HEAT EXCHANGE SYSTEM

Forest J. Saxton, 1256 Mitzi Dr., Calistoga, Calif. 94515

Filed May 13, 1977, Ser. No. 796,610
Int. Cl.[2] B01F *3/04*
U.S. Cl. 261—25 **8 Claims**



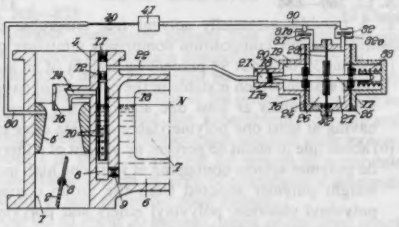
1. A liquid cooling heat transfer system comprising:
a tower;
means for spraying warm liquid in said tower from an upper level thereof;
a vertical shaft rotatably mounted in said tower;
a multiplicity of arms extending radially from said shaft over a considerable portion of the length thereof;
said arms being of generally triangular cross-section wherein upper surfaces of said arms slope downward in the same direction from leading edges thereof so that impingement of falling water drops thereon impart force vectors toward said leading edges and lower surfaces of said arms slope upward from leading surfaces thereof so that impingement of rising air currents thereon impart force vectors toward said leading edges.
an opening in said tower near the lower levels thereof; and
air impelling means on said shaft to draw air into said tower through said opening.

4,092,380

CARBURETORS FOR INTERNAL COMBUSTION ENGINES

Michel E. Pierlot, Le Pecq, and Cyrille F. Pavlin, Septeuil, both of France, assignors to Societe Industrielle de Brevets et d'Etudes S.I.B.E., France

Filed Jun. 13, 1977, Ser. No. 806,095
Claims priority, application France, Jun. 17, 1976, 76 18406
Int. Cl.[2] F02M *7/20*
U.S. Cl. 261—69 R **6 Claims**



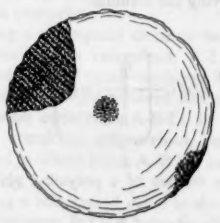
1. A carburettor for an internal combustion engine having an induction passage, a circuit for delivering a primary air/fuel mixture into said induction passage and a device for correcting the richness of the air/fuel mixture supplied by the carburettor in dependence of the amplitude of the alternating pressure component which prevails in operation in the induction passage, wherein said correction device has a member for metering a fuel or air flow cross-sectional area in said circuit and means for controlling said member in dependence of said alternating component, including a capillary tube and a capacity located in series flow relation from the induction passage to the member, constituting a frequency filter which transmits the depression which prevails in the induction passage with a dampening of the alternating component which increases with the frequency of that component.

4,092,381

METHODS OF FABRICATING MICROSPONGE DEUTERATED HYDROCARBON POLYMER TARGETS WHICH EMIT NEUTRONS WHEN IRRADIATED BY HIGH ENERGY BEAMS

Gerald M. Halpern, Sommerville, and Hyogun Kim, Scotch Plains, both of N.J., assignors to University of Rochester, Rochester, N.Y.

Filed Jan. 5, 1976, Ser. No. 646,727
Int. Cl.[2] B29C *23/00*; B29D *27/00*
U.S. Cl. 264—15 **21 Claims**



1. A method for the fabrication of elements, for use as targets for a high energy beam, and which provide neutrons by interaction with said beam, said method comprising the steps of
(a) forming deuterated hydrocarbon polymer material into solid bodies which are of sizes which are less than about 300 microns diametrically,

(b) cross-linking the molecules of the material with radiation, and

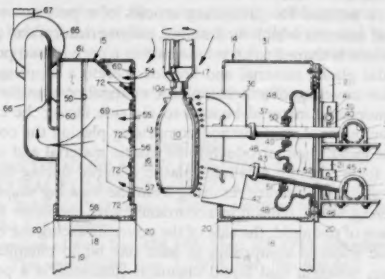
(c) increasing the size of said cross linked bodies while reducing the mass thereof with the aid of a fluid which is a solvent for the un-cross-linked portions of the material and a swelling agent for the cross-linked portions thereof which causes said bodies to partially dissolve and to swell, thereby providing said bodies with a micro-sponge structure of cells of a size which does not exceed about 1 micron, said microsponge structure bodies providing said elements.

4,092,382

METHOD OF HEAT SHRINKING THERMOPLASTIC SLEEVE WRAPS ON GLASS CONTAINERS

Russell William Heckman, Perrysburg, and George Allen Nickey, Toledo, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 31, 1976, Ser. No. 672,082
Int. Cl.² B29D *27/00*
U.S. Cl. 264—25 **14 Claims**



1. The method of heating a heat shrinkable material for forming an encircling wrap thereof on an article comprising

providing an article with its axis disposed vertically and having a loosely fit encircling form of said plastic about said axis and on the exterior of the article to be wrapped,

moving the article in a direction normal to its said axis and in a heating apparatus,

rotating the article about its axis during said movement in the heating apparatus, while sequentially:

moving the article past an infrared heat generator for heating a central annular portion of the encircling form and thereby shrinking the portion firmly onto the article,

moving the article past a second infrared generator for heating an end portion of the encircling form and shrinking said end portion firmly onto the article, and

moving the article past a third infrared generator for heating the other end portion of the encircling form and shrinking said other end portion firmly onto the article,

said rotating movement applying a centrifugal force to portions of said loose fitting sleeve sufficient to maintain same erect until such portions are heat shrunken onto the article; thereby providing an encircling wrap on the article free of surface waves or wrinkles.

4,092,383

MODIFICATION OF BALLISTIC PROPERTIES OF HMX BY SPRAY DRYING

Russell Reed, Jr., Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 15, 1977, Ser. No. 824,372
Int. Cl.² C06B *21/00*
U.S. Cl. 264—3 C **12 Claims**

1. A method for rendering an explosive selected from the group consisting of cyclotetramethylenetetranitramine, cyclotrimethylenetrinitramine and mixtures thereof wettable by a binder comprising the steps of:

A. selecting an additive which is compatible with said binder;

B. dissolving said additive and explosive in a common solvent to form a solution; and

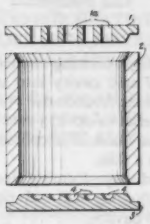
C. dispersing drops of said solution into warm air whereupon the solvent evaporates and crystals of the explosive having molecules of said additive closely associated therewith are formed.

4,092,384

BLOCK FUEL ELEMENT FOR GAS-COOLED HIGH TEMPERATURE REACTORS

Milan F. Hrovat, Oberrodenbach, Germany, assignor to Nukem GmbH, Hanau, Germany

Continuation of Ser. No. 3,284, Jan. 16, 1970, abandoned. This application Feb. 26, 1975, Ser. No. 553,205
Int. Cl.² G21C *21/00*
U.S. Cl. 264—.5 **10 Claims**



1. A method of making a block fuel element comprising the steps of compacting a charge of graphite press powder to provide a self-sustaining prismatic preform of a block fuel element, said preform being formed with a plurality of channels extending therethrough parallel to the axis of said prismatic preform, filling selected channels of said preform first with a thin layer of graphite, then in the principal length of said selected channels with a jacketed, coated fuel particles mixed with a small proportion of a graphite powder, and finally with an additional thin protective layer of graphite, providing rods extending through the said channels which are not filled with fuel particles, and subjecting the preform carrying said fuel particles and said rods to an isostatic pressure sufficiently high to compress said channels radially against said fuel particles and said rods to form a uniformly densely compacted self-sustaining block fuel element.

4,092,385

METHOD OF PRODUCING MOLDED PARTS WITH A SMOOTH NONCELLULAR SKIN AND A CELLULAR CORE FROM FOAMABLE THERMOPLASTIC MATERIAL

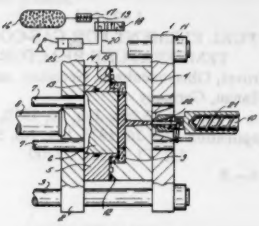
Angel Tonchev Balevski; Ivan Dimov Nikolov, both of Sofia; Evgeni Hristov Mateev, Pleven; Todor Kostadinov Trifonov, Pleven, and Vassil Vladimirov Kojuharov, Pleven, all of Bulgaria, assignors to Institute Po Metaloznanie I Technologia Na Metalite, Sofia, Bulgaria

Filed Nov. 24, 1975, Ser. No. 634,527
Claims priority, application Bulgaria, Nov. 25, 1974, 28282
Int. Cl.² B29D *27/00*
U.S. Cl. 264—45.5 **6 Claims**

1. A method of producing a molded foamed article having a predetermined shape and volume with a smooth noncellular skin and cellular core from a foamable injection-moldable thermoplastic resin material containing a blowing agent, comprising the steps of:

(a) closing a mold and defining thereby a mold cavity having a variable volume;

(b) heating a gas to a temperature higher than that of said mold;
(c) introducing said gas into said cavity at a pressure higher than the partial pressure of the gaseous products evolved upon the decomposition of said blowing agent and lower than the injection pressure of said materials;
(d) pulsing said gas in said cavity;
(e) injecting said material from an injection cylinder into said cavity against said gas pressure and occupying a portion of the volume thereof;



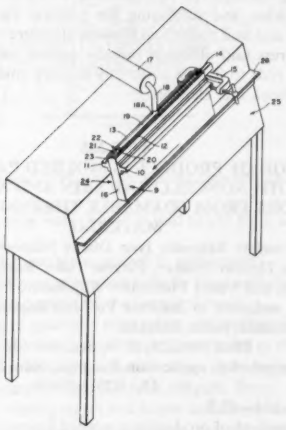
(f) projecting a shape-forming element forming a major part of one wall of said cavity into said cavity against said material to thereby reduce the volume of said cavity and press said material to occupy said cavity entirely;
(g) permitting said material in contact with the walls of said cavity to form a skin;
(h) retracting said shape-forming element from its projected position and allowing said material to expand to the full volume of said cavity;
(i) permitting the fully-expanded material to harden; and
(j) opening said mold and ejecting the molded article from said cavity by advancing said element.

4,092,386

BATTERY ENVELOPING WITH FOAM

Dennis A. Rigstad, Warsaw, Ind., assignor to W. R. Grace & Co., Cambridge, Mass.

Filed Jul. 9, 1975, Ser. No. 594,454
Int. Cl.[2] B29D *27/00*
U.S. Cl. 264—46.5 **8 Claims**



1. The method of forming battery separator envelopes for battery plates comprising positioning two walls of porous battery separator adjacent to one another and spaced from one another by a mandrel which stops short of their outer edges in at least one region leaving a channel, securing rigid supporting members extending along the outer edges of said two walls of porous battery separator on their sides opposite said mandrel and adjacent to said channel, and thereafter extruding a bead of a foamable thermoplastic resin composition into said channel between said adjacent walls while not confining said bead along at least one of its expanding surfaces during at least part of its active placement, said bead expanding into direct secure engagement with said porous adjacent walls and forming a wall that is free standing on at least one side.

4,092,387

PROCESS FOR THE PRODUCTION OF ARTICLES OF CELLULAR PLASTIC PROVIDED WITH A COVERING OF ANOTHER MATERIAL

Nils Owe Pärsson, Trollhattan, and Hans Harald Dymling, Gothenburg, both of Sweden, assignors to Saab-Scania AB, Sodertalje, Sweden

Continuation of Ser. No. 479,179, June 13, 1974, abandoned.
This application Jan. 26, 1976, Ser. No. 652,056
Claims priority, application Sweden, Jun. 18, 1973, 7308505
Int. Cl.[2] B29D *27/00*
U.S. Cl. 264—46.6 **6 Claims**

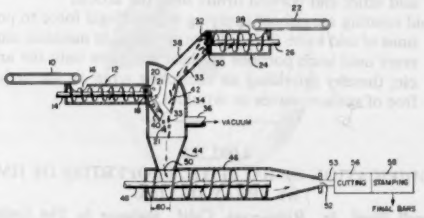
1. A method for producing articles of a polymer cellular plastic material which by foaming, polymerization and gelling in a mold is shaped to an article having a core of said polymer cellular plastic material and bonded thereto a supplementary surface covering of a thermoplastic material or a textile with a thermoplastic material bonded to the side facing the cellular plastic material, said method comprising placing the covering in the mold, then introducing the plastic material and causing it to foam forming a cellular plastic material during filling of the mold, the pressure resulting from the foaming shaping the covering under tension in accordance with the inner limiting surface of the mold, the side of the covering facing the cellular plastic material comprising at least one liquid chemical substance, wherein said liquid chemical substance is a polyurethane varnish containing an excess amount of polyol or an acyl chloride which causes a retardation of the chemical reaction bonding the cellular plastic material to the covering by generating a temporary adhesion-poor layer, whereby the cellular plastic material is able to expand freely in the mold and to bond to the covering without forming a deformed cellular structure in the cellular plastic material in the boundary layer adjacent to the covering.

4,092,388

APPARATUS AND PROCESS FOR MANUFACTURE OF VARIEGATED SOAP BARS

William Platt Lewis, West Chester, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 3, 1976, Ser. No. 738,782
Int. Cl.[2] B29F *3/12*
U.S. Cl. 264—75 **13 Claims**



1. Apparatus for production of variegated soap bars, said apparatus comprising:
(a) means to form soap noodles of one color;
(b) means to form soap noodles of a second color;
(c) means to receive the noodles from means (a) and means (b) to form a common stream of noodles;

(d) plodder means having a rotatable worm to process the noodles into a variegated soap log;
(e) means for forming the soap log into variegated soap bars;
(f) means for receiving noodles from the means (c) and providing a bed of noodles for choke feeding of the plodder means and having outlet means for communicating essentially only with a portion of the worm of the plodder means (d) which turns downwardly on rotation of such worm.

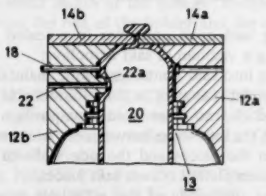
12. Process for manufacture of variegated soap bars, said process comprising:
(a) providing a soap mass of one color;
(b) providing a soap mass of a second color;
(c) plodding the soap mass of the one color to compact and extrude the same and form noodles;
(d) plodding the soap mass of the second color to compact and extrude the same and form noodles;
(e) directing the noodles to form a common stream to provide one bed of noodles;
(f) feeding noodles downwardly from said bed into a plodding means while restricting lateral and longitudinal motion of noodles in said bed by use of a hopper means which feeds said noodles onto essentially only the downwardly-turning portion of the worm of said plodding means;
(g) plodding the noodles fed downwardly from said bed to compact and extrude the same and form a variegated soap log;
(h) forming the log into variegated soap bars.

4,092,389

METHOD OF BLOW MOLDING AND THEN EXHAUSTING HOLLOW PLASTIC ARTICLES

Eishiro Sakurai, Yokohama, Japan, assignor to Toyo Seikan Kaisha Ltd., Japan

Continuation of Ser. No. 456,197, Mar. 29, 1974, abandoned. This application Dec. 1, 1975, Ser. No. 636,642
Claims priority, application Japan, Apr. 28, 1973, 48-47364
Int. Cl.² B29C *17/07*
U.S. Cl. 264—89 **3 Claims**



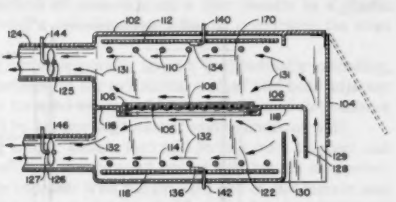
1. In a method of manufacturing a hollow plastic article of the type comprising the steps of extruding plastic material into a tube which is utilized to form unit parisons, accommodating each unit parison in a closed metal mold having a cavity therein, sealing the upper and lower ends of the unit parison accommodated in said metal mold, blowing pressurized gas into said sealed unit parison for blow molding the same in said metal mold, the improvements comprising the steps of:
transversely inserting a blunt nozzle tube through said metal mold until the inner end of said nozzle protrudes into said cavity 2 to 5 mm, but not through the side wall of said unit parison after the upper and lower ends of the unit parison have been sealed;
ejecting pressurized gas through said nozzle against the outside of the wall of said unit parison sealed in the metal mold, thereby forming a gas inlet opening through said side wall of the unit parison and inflating said unit parison against the inner wall of the cavity by the pressurized gas ejected into said unit parison through said inlet opening;
providing a transverse exhaust opening for said metal mold at a position corresponding to a portion of the molded article to be cut away after the hollow article has been formed;
providing a mold configuration at said transverse exhaust opening which will result in reduced stretching of the parison during said inflating and thereby forming that portion of the wall of the molded article at said transverse exhaust opening to be thicker than the rest of the wall of the molded article, said thicker portion being sufficiently thick to be sustained in a semi-solid state during blow molding of said article;
forming an exhaust port through said thicker wall portion by raising the internal pressure within the molded article until said semi-solid thicker wall portion is forced open at said exhaust opening;
retracting said blunt nozzle tube away from the molded article; and
exhausting the pressurized gas from the molded article through said exhaust port and said transverse exhaust opening, thereby removing the gas from the molded article and enhancing the cooling thereof.

4,092,390

SYSTEM AND METHOD FOR HEATING AND FORMING THERMOPLASTIC MATERIAL

R. F. Mulvany, Jr., 803 N. Humboldt, #201, San Mateo, Calif. 94401

Continuation-in-part of Ser. No. 335,401, Feb. 23, 1973, abandoned. This application May 3, 1976, Ser. No. 682,887
Int. Cl.² B29C *17/06*
U.S. Cl. 264—94 **7 Claims**



1. A method of heating thermoplastic material to allow for subsequent forming of said material, said method comprising the steps of placing the thermoplastic material in an oven between opposing arrays of infrared heating elements each having reflector means located behind the respective heating elements relative to the thermoplastic material to reflect radiation from each said array toward the thermoplastic material, heating the thermoplastic material with the infrared heating elements, sensing the temperature of said reflector means, and controlling the temperature of said reflector means by simultaneously drawing air from outside the oven into the oven, venting heated air from the oven, and controlling said venting to maintain the reflector means at a substantially constant temperature to control the heating of said thermoplastic material.

4,092,391

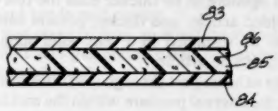
METHOD OF MAKING MULTILAYERED CONTAINERS

Emery I. Valyi, 5200 Sycamore Ave., Riverdale, N.Y. 10471

Continuation-in-part of Ser. No. 710,171, Jul. 30, 1976, Pat. No. 4,048,361, which is a continuation of Ser. No. 518,264, Oct. 29, 1974, abandoned. This application Nov. 22, 1976, Ser. No. 743,644
Int. Cl.² B65D *23/00, 23/02*
U.S. Cl. 264—97 **12 Claims**

1. In the method of making multilayered hollow plastic containers having improved resistance to gas permeation wherein a parison is formed on a core in a parison mold by molding the plastic around said core in a parison mold cavity and wherein the parison is subsequently expanded in a blow

mold, the improvement which comprises: providing a laminated sleeve of a first plastic carrier layer containing a getter material capable of binding unwanted gas and a second barrier plastic layer having substantial but incomplete resistance to gas permeation; applying said sleeve to said core; molding a plastic



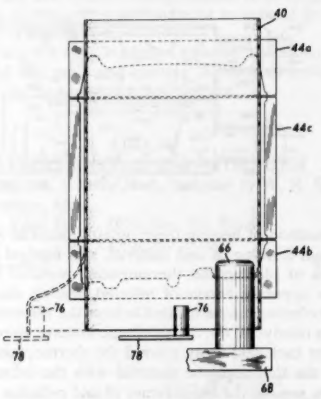
material around said sleeve and core; and expanding the sleeve and molded plastic together in a blow mold to form a hollow plastic container having improved resistance to gas permeation, wherein successive stations are used to apply said sleeve to said core, to mold a plastic around said sleeve, and to expand the sleeve and molded plastic together.

4,092,392

METHOD FOR MAKING A PLASTIC CONTAINER HAVING A PORT ADJACENT THE CONTAINER PERIPHERY

George H. Dunbeker, Hightstown, N.J., assignor to Rheem Manufacturing Company, New York, N.Y.

Filed Sep. 20, 1976, Ser. No. 725,004
Int. Cl.[2] B29C *17/07*
U.S. Cl. 264—98 **3 Claims**



1. A method for making a plastic container having a port adjacent the container periphery comprising the steps of:

(a) feeding a tubular parison into stationary position between opposed mutually spaced movable molding members and about a port forming blow pin positioned in the path of movement of said molding members at a location which will be adjacent a container sidewall forming portion of said molding members when said members are in a closed position;

(b) while maintaining said blow pin fixedly positioned and in restraining relation to a first surface of said parison which will utimately define a portion of said port, selectively engaging a second surface of said parison, said second surface being located outwardly of the path of movement of said molding members and diametrically opposite said first surface and displacing said second surface, thereby stretching said parison unidirectionally transversely of the direction of such feeding thereof against such blow pin restraint on said first surface so as to stretch that portion of said parison which will define said container sidewall in the vicinity of said port and thereby avoid buildup of plastic in said portion; then

(c) moving said molding members into engagement with such stretch parison; and

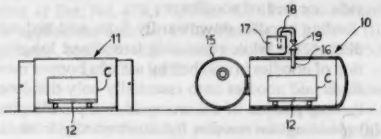
(d) introducing pressurized air interiorly of said stretched parison to conform said stretched parison to said molding members.

4,092,393

METHOD OF MAKING BLOCKS AND PLATES FROM PIECES OF MARBLE AND OTHER NATURAL STONES

Giuseppe Marocco, Turin, Italy, assignor to Soberman Establishment, Balzers, Liechtenstein

Filed Feb. 18, 1976, Ser. No. 658,968
Claims priority, application Italy, Feb. 20, 1975, 67442 A/75
Int. Cl.[2] B28B *23/22*
U.S. Cl. 264—102 **10 Claims**



1. Method for the production of blocks from pieces of marble and similar natural stones, said method comprising the following series of steps:

a. providing a plurality of pieces of marble or similar natural stone having a plurality of plane faces, at least two of which are rough and parallel to each other;

b. stacking said pieces in a plurality of layers with a plurality of pieces in each layer in an open container having internal shape and dimensions corresponding to those of the block to be obtained and whose side walls and bottom wall are liquid-tight, said pieces within each layer having the same thickness and being arranged with their plane faces facing adjacent layers so as to form a plurality of parallel layers, each layer being delimited by a plurality of each plane faces;

c. placing said open container in a sealed autoclave and applying a vacuum in said autoclave;

d. pouring into said container, while maintaining the autoclave under vacuum, a fluid hardenable resin binding composition, so that said composition flows down through the interstices between one piece and another and between the pieces and the side walls of the container, until it completely covers said pieces;

e. bringing the inside of the autoclave to atmospheric or super-atmospheric pressure, thus causing said fluid binding composition to thoroughly penetrate into all said interstices, including those caused by the roughness of said plane faces, and into all the cavities of the pieces opening on the surface of said pieces;

f. allowing said binding composition to harden; and

g. removing from said container the thus consolidated block, formed by the pieces and hardened binding composition.

4,092,394

MANUFACTURE OF DRAUGHT EXCLUDERS

Bernard Dixon, Cambridge, England, assignor to Dixon International Limited, United Kingdom

Filed Nov. 5, 1975, Ser. No. 628,938
Int. Cl.[2] D01D *5/12;* **D01F** *11/00*
U.S. Cl. 264—210 R **3 Claims**

1. A process of assembling a draught excluder of the kind consisting of an elongate holder and a seal of elastomeric strip inserted and retained in a groove extending along the holder, the holder having internal flanges which define the mouth of the groove, the seal having a longitudinal foot portion in the

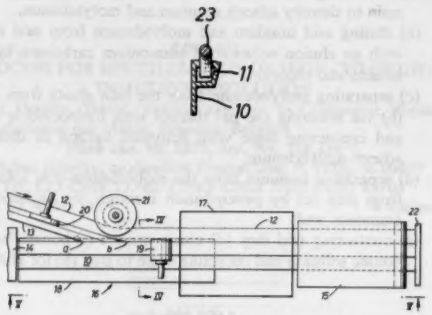
groove, and a complementary longitudinal portion which protrudes from the mouth of the groove, the process comprising:

extruding the holder in malleable material and supporting the holder;

driving the seal per se towards the holder at the rate and in the sense of the holder being extruded;

guiding the driven seal to converge on the holder;

inserting the foot portion of the driven seal in a substantially relaxed state into the holder whilst the holder is in a malleable state from the extrusion the mouth of the groove gaping preparatory to the insertion of the foot portion of



the seal into the groove, i.e., the mouth being of greater width than the foot portion of the seal at the location along the holder where the seal is being inserted; and, after insertion of the seal at said location, applying pressure on the holder on the side of the mouth whilst supporting the holder on the other side of the mouth and whilst the seal is in a substantially relaxed state, thereby to narrow the mouth to the extent that said foot portion and said internal flanges retain the seal;

moving progressively along the holder the location at which insertion and retention of the seal takes place; and

severing a finished length of the draught excluder thus assembled, from the rest of the holder and the seal.

4,092,395

METHOD OF MAKING FLUID TREATMENT MODULES

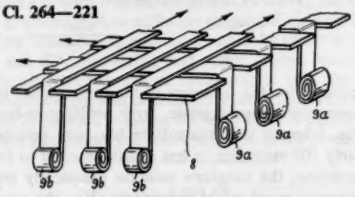
Jacques Maire, Epinay sur Seine, and Robert Grémion, Saint-leu-la-Foret, both of France, assignors to Le Carbone-Lorraine, Gennevilliers, France

Division of Ser. No. 553,899, Feb. 27, 1975. This application Aug. 24, 1976, Ser. No. 717,402

Claims priority, application France, Mar. 1, 1974, 74 07016

Int. Cl.² B29C *1/02*

U.S. Cl. 264—221 **9 Claims**



1. A method of making a body containing cavities of predetermined shape, said cavities forming two independent systems of regularly distributed intersecting channels with the channels in any one system intercommunicating via ducts are themselves regularly distributed, said method comprising forming a negative for winding first and second series of strips made of an easily removable substance alternately around a plate, said strips being regularly spaced from one another and wound in directions which are parallel for each series, the said series of strips being wound onto the said plate in two alternating directions which intersect so that there are generally parallel spaces between the strips of each series, forming ducts in the material to connect selected strips of one of said series with selected strips of the other of said series, injecting body forming material around said series of wound strips, and removing the material of said strips after the body forming material sets.

4,092,396

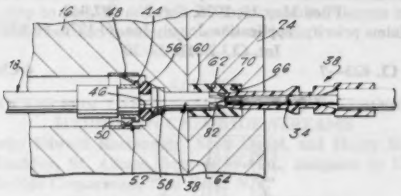
FIBER BUNDLE CONSOLIDATION

Ronald L. McCartney, Orange; Vaughn C. Hogan, Sun Valley; Eleanor A. Landgreen, Temple City, and Michael I. Bauerkemper, Cerritos, all of Calif., assignors to International Telephone & Telegraph Corporation, New York, N.Y.

Division of Ser. No. 610,223, Sep. 4, 1975, Pat. No. 4,021,098. This application Mar. 11, 1977, Ser. No. 776,638

Int. Cl.² B29C *15/00, 27/30*

U.S. Cl. 264—249 **1 Claim**



1. A method of consolidating a fiber bundle in a plastic ferrule having a cylindrical bore therein comprising the steps of:

forming circumferentially spaced, longitudinally extending, flat surfaces on the cylindrical wall of said bore adjacent to the forward end of said ferrule with said flat surfaces joined by arcuate segments of said cylindrical wall;

inserting a fiber bundle into said ferrule from the rear end thereof until the forward end of said bundle is approximately coplanar with the forward end of said ferrule; and

applying a compressive external force to the outer surface of said ferrule adjacent to said forward end thereof to constrict said ferrule around said bundle and consolidate the fibers in said bundle into a closed pack array.

4,092,397

PYROCHEMICAL SEPARATION OF PLUTONIUM FROM IRRADIATED NUCLEAR FUELS, BY THERMAL DECOMPOSITION IN MOLTEN NITRATES

Giovanni Brambilla, Stagno (Livorno), and Giacomo Caporali, Pisa, both of Italy, assignors to Agip Nucleare, S.p.A., Rome, Italy

Filed Mar. 17, 1976, Ser. No. 667,669

Claims priority, application Italy, Mar. 17, 1975, 21319/75

Int. Cl.² C01G *56/00*

U.S. Cl. 423—5 **4 Claims**

1. A method for the pyrochemical separation of plutonium from an irradiated nuclear fuel element discharged from a fast reactor and containing uranium oxide and plutonium oxide, or uranium carbide and plutonium carbide mixtures thereof, which comprises the following steps:

a. severing the irradiated nuclear fuel element;

b. disaggregating the fuel element by placing it in a bath of a molten alkali metal nitrate and/or alkaline earth metal nitrate heated to 480°-500° C;

c. effecting dissolution of the oxides and/or carbides in the bath produced through step *b* by passing nitric vapors through said bath at a temperature of 250° C;

d. filtering insoluble fission products out of the bath produced by step *c*;

e. decomposing the plutonium compound in the filtrate from step *d* by raising the temperature of said filtrate to 300° C

and holding the same in an atmosphere of nitric vapors so that plutonium is precipitated; and

f. filtering out the plutonium precipitated in step *e*.

4,092,398

ION EXCHANGE APPARATUS FOR URANIUM TECHNOLOGY

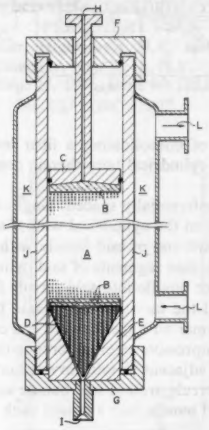
Tetsuya Miyake; Maomi Seko, both of Tokyo; Kunihiko Takeda, Yokohama; Akihiko Ikeda, Yokohama, and Kazuo Imamura, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 19, 1976, Ser. No. 687,843

Claims priority, application Japan, Jun. 6, 1975, 50-67679

Int. Cl.[2] B01D *59/30*

U.S. Cl. 423—7 **4 Claims**



1. In a process for separation of uranium isotopes, which comprises displacing at least one redox boundary formed between an adsorption zone of a uranium isotope mixture and a reducing agent or an oxidizing agent through an anion exchange column while conducting a redox reaction at said boundary thereby to concentrate at least one isotope in the region near said boundary, the improvement comprising effecting the separation employing an anion exchange column containing a resin bed of anion exchange resin particles packed therein and having distributors for liquid provided at both ends of said resin bed, said anion exchange resin particles being uniform in degree of sphericity, average particle size and particle size distribution represented by Uniformity Constant D_{60}/D_{10} as specified by the following relations:

(A) 20 microns $\leqq \phi \leqq$ 200 microns;

(B) $D_{60}/D_{10} \leqq 1.7$

(C) $1 \leqq \alpha/\beta \leqq 2$ for at least 90% of anion exchange particles,

wherein ϕ is the average diameter of the whole ion exchange resin particles; D_{60} and D_{10} are the diameters of the particles corresponding to the values on a diameter-volume distribution curve where the integrated volume from the smallest diameter to said values are 60% and 10%, respectively, of the total volume of the whole particles; and α and β are the longest axis and the shortest axis of each anion exchange resin particle, respectively.

4,092,399

RECOVERY OF URANIUM FROM CARBONATE LEACH SOLUTIONS

Kailash Narayan, Westlake Village, and Richard D. Pick, Thousand Oaks, both of Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 1, 1976, Ser. No. 746,447

Int. Cl.[2] C01G *43/00, 39/00*

U.S. Cl. 423—7 **3 Claims**

1. A method of recovering uranium from an ammonium carbonate leach solution containing same and molybdenum, which comprises in combination:

(a) contacting said solution with a strong base ion-exchange resin to thereby adsorb uranium and molybdenum,

(b) eluting said uranium and molybdenum from said resin with an elution solution of ammonium carbonate/bicarbonate/and chloride,

(c) separating molybdenum from the rich eluate from step (b) via lowering the pH thereof with hydrochloric acid and contacting same with activated carbon to thereby adsorb molybdenum,

(d) separating uranium from the molybdenum-free solution from step (c) by precipitation through the addition of ammonia, and

(e) contacting said step (d) eluate with a carbonate/bicarbonate solution and recycling same to step (b) for elution.

4,092,400

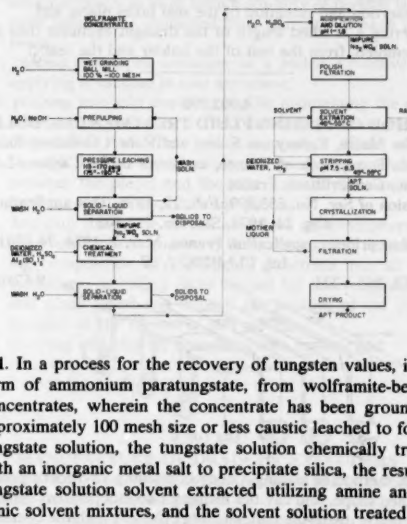
PROCESS FOR RECOVERING HIGH PURITY TUNGSTEN COMPOSITIONS FROM WOLFRAMITE ORES

Vladimir Zbranek; Zdenka Zbranek, both of Littleton, and Daniel Arthur Burnham, Wheatridge, all of Colo., assignors to Engelhard Minerals & Chemicals Corp., Iselin, N.J.

Filed Apr. 11, 1977, Ser. No. 786,081

Int. Cl.[2] C01G *41/00*

U.S. Cl. 423—54 **8 Claims**



1. In a process for the recovery of tungsten values, in the form of ammonium paratungstate, from wolframite-bearing concentrates, wherein the concentrate has been ground, to approximately 100 mesh size or less caustic leached to form a tungstate solution, the tungstate solution chemically treated with an inorganic metal salt to precipitate silica, the resultant tungstate solution solvent extracted utilizing amine and organic solvent mixtures, and the solvent solution treated with ammoniated water to strip ammonium paratungstate from the solvent solution, the improvement which comprises:

(a) accomplishing said caustic leaching at pressures of from about 35 to about 355 psig and temperatures of from about 135° to about 255° C to produce a slurry; thereafter

(b) filtering said slurry to obtain a filtered tungstate solution;

(c) in said chemical treatment, the steps of adding acid to the tungstate solution to reduce the pH to about 8 to 11,

adding said inorganic metal salt to precipitate silica, and recovering a tungstate solution substantially free of silica;

(d) acidifying to reduce the pH of the resultant tungstate solution prior to solvent extraction to a range from about 1 to 1.8 and maintaining the pH in this range during solvent extraction, whereby, upon solvent extraction, loading in the solvent phase in excess of about 100 grams per liter of tungstic oxide is achieved;

(e) accomplishing said stripping while maintaining the aqueous phase at a pH of about 7.5 to 8.5 and allowing sufficient retention time, accompanied by agitation, such that solids of ammonium paratungstate formed redissolve; and

(f) recovering ammonium paratungstate from the resulting solution.

4,092,401

PROCESS FOR REUTILIZATION OF IRON CHLORIDES IN AQUEOUS SOLUTION

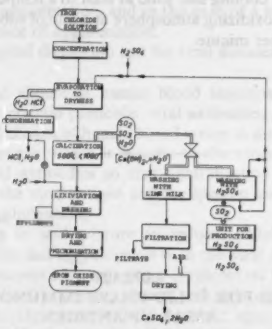
Nöel Dreulle, Douai, France, assignor to Compagnie Royale Asturienne des Mines, Brussels, Belgium

Filed Jan. 10, 1977, Ser. No. 758,136

Claims priority, application France, Jan. 9, 1976, 76 00409

Int. Cl.[2] C01F *11/46, 11/48;* C01B *7/08;* C01G *49/02*

U.S. Cl. 423—166 **6 Claims**



1. Process for the recovery of a pigment-grade red iron oxide and technical hydrochloric acid of any desired molarity from aqueous iron chloride solutions, comprising concentrating a solution of iron chloride until the chloride ion concentration thereof is equal to the desired molarity of the techincal hydrochloric acid produced; adding to said concentrated solution concentrated sulfuric acid in slight stoichiometric excess relative to the iron of the solution, evaporating the solution to dryness, condensing the vapors from the evaporation step thereby to recover hydrochloric acid of said desired molarity, calcining the dry iron sulfate produced during the evaporation step at a temperature sufficient to decompose said iron sulfate thereby substantially entirely to drive off sulfur in the form of SO_2 and SO_3 recovering said sulfur oxides, leaching with a dilute aqueous solution of hydrochloric acid the iron oxide produced during said calcination so as to remove soluble metal sulfate impurities, washing the leached iron oxide, drying the washed iron oxide, and micropulverizing the dried iron oxide.

4,092,402

METHOD FOR REMOVING SULFUR DIOXIDE FROM EXHAUST GAS

Akio Kobayashi; Kunihide Yaguchi, and Masakazu Takaiwa, all of Twaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 15, 1976, Ser. No. 696,285

Claims priority, application Japan, Jun. 23, 1975, 50-77224

Int. Cl.[2] C01B *17/00*

U.S. Cl. 423—243 **8 Claims**

1. In a method for removing sulfur dioxide from an exhaust gas wherein the exhaust gas is contacted with an aqueous scrubbing solution containing an organic acid alkali salt in a contact zone to absorb the sulfur dioxide in the scrubbing solution in the form of alkali sulfite and alkali sulfate, wherein at least a portion of the solution is oxidized with oxygen or air to convert the alkali sulfite into alkali sulfate and, thereafter, calcium carbonate or calcium hydroxide is added to the resultant solution to convert the alkali sulfate to calcium sulfate, and the calcium sulfate is separated from the reaction solution and the resultant filtrate, along with any non-oxidized portion of said aqueous solution, is recycled for contact with said exhaust gas, the improvement comprising

(a) using as the aqueous scrubbing solution feed to the contact zone, a solution containing at least 0.3 percent by weight of solid crystalline gypsum;

(b) controlling the concentration of alkali sulfite in the aqueous solution exiting the contact zone at not more than 2 percent by weight; and

(c) concentrating a part of the effluent from the oxidizing step to convert the chlorine ions contained therein into a solid salt and separating the formed salt.

4,092,403

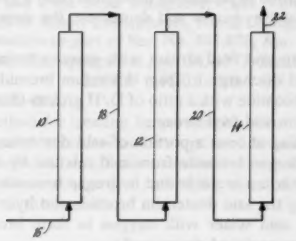
PROCESS FOR THE PURIFICATION OF BY-PRODUCT HYDROGEN CHLORIDE STREAMS

Charles Edward Rectenwald, Scott Depot, and Henry Bishop Hinckley, St. Albans, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Aug. 12, 1976, Ser. No. 713,681

Int. Cl.[2] C01B *7/08;* B01D *53/34*

U.S. Cl. 423—488 **8 Claims**



1. A process for the purification of a by-product hydrogen chloride stream containing fluoride impurities including carbonyl fluoride, comprising contacting said stream with low-silica containing activated alumina maintained at a temperature of at least 55° C. to simultaneously adsorb said fluoride impurities, and recovering the purified hydrogen chloride so separated.

4,092,404

CATALYTIC INCINERATION OF HYDROGEN SULFIDE FROM GAS STREAMS

Robert H. Hass, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Aug. 18, 1975, Ser. No. 605,638

Int. Cl.[2] G01B *17/50*

U.S. Cl. 423—539 **17 Claims**

1. A process for oxidizing H_2S to SO_2 in a feed gas containing a minor proportion of H_2S and a substantial proportion of H_2, which process comprises:

(1) contacting said feed gas, in admixture with oxygen supplied in excess of the amount required to convert all of said H_2S to SO_2, with an oxidation catalyst at a temperature between about 300° and 900° F so as to convert at least some of said H_2S to SO_2, said oxidation catalyst comprising a vanadium oxide and/or sulfide as the essential active component supported on a non-alkaline porous

refractory oxide, said contacting converting essentially none of said H_2S or SO_2 to SO_3; and

(2) recovering a gaseous effluent of reduced H_2S content, but still containing essentially all of said H_2.

4,092,405

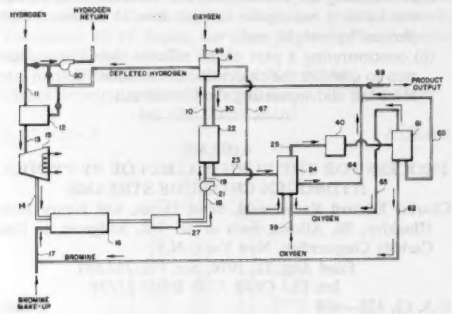
SEPARATION OF DEUTERIUM FROM HYDROGEN

Charles W. von Rosenberg, Jr.; James J. Ewing, both of Belmont, Mass.; Robert E. Center, Bellevue, Wash., and Hao-Lin Chen, Walnut Creek, Calif., assignors to Avco Everett Research Laboratory, Inc., Everett, Mass.

Filed Jun. 1, 1976, Ser. No. 691,473

Int. Cl.[2] C01B *5/02, 1/00;* **B01K** *1/00*

U.S. Cl. 423—580 **16 Claims**



16. In a method of separating deuterium from a gaseous feed stream of mixed hydrogen and deuterium, the steps comprising:

(a) exposing said feed stream with gaseous bromine to an electrical discharge to form deuterium bromide and hydrogen bromide with a ratio of D/H greater than the ratio of D/H in said feed stream;

(b) separating at least a portion of said deuterium bromide and hydrogen bromide from said mixture by dissolving said deuterium bromide and hydrogen bromide in water;

(c) reacting the said deuterium bromide and hydrogen bromide in said water with oxygen to form bromine and deuterium enriched water; and

(d) separating the bromine reactant product from said enriched water.

4,092,406

FERRO LIME

Allen R. Job, Pincourt, Canada, assignor to Domtar Inc., Montreal, Canada

Filed Aug. 20, 1976, Ser. No. 716,238

Int. Cl.[2] C01G *49/00;* **C01B** *13/14;* **C21C** *7/00;* **C22B** *9/00*

U.S. Cl. 423—594 **2 Claims**

1. A method of producing ferro-lime in a rotary lime kiln having an inlet end, comprising feeding calcium carbonate containing stones selected from the group consisting of limestone, dolomitic limestone or dolomite stone, together with pellets formed predominately of mill scale into the inlet end of the kiln, said pellets containing no more than 12% silica by weight based on the iron content of said mill scale and being sufficiently strong to withstand the tumbling action within the kiln without significant disintegration, said stone having a size between ¼ and 2½ inches and said pellets having a size between ¼ and 1½ inches, selecting the size and density of said pellets in relation to the size and density of said stone to ensure proper mixing of said pellets and said stone during travel through the kiln, calcining said calcium carbonate in said stone to form lime and reacting said lime as it is formed with the iron in said mill scale thereby to form ferro-lime in said kiln.

4,092,407

PRODUCING IRON OXIDE WEIGHTING MATERIALS FOR DRILLING FLUIDS

Hans-Joachim Rohrborn, Kapellen bei Moers; Rainer Homann, Duisburg; Heribert Conrady, Duisburg, and Dieter Menzel, Duisburg, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jun. 24, 1976, Ser. No. 699,257

Claims priority, application Germany, Jun. 26, 1975, 2528464

Int. Cl.[2] C01G *49/02;* **C09K** *7/00*

U.S. Cl. 423—633 **5 Claims**

1. A process for producing a weighting material of limited magnetic susceptibility for a drilling fluid which comprises the steps of:

(a) firing an iron-oxide solid material consisting of calcined fine pyrites or calcined pyrites recovered by flotation, having a relatively high magnetic susceptibility at a temperature between 1210° C and 1400° C in the presence of an oxidizing atmosphere having an oxygen partial pressure in excess of the equilibrium partial pressure of the oxide at the firing temperature, for a period of 10 to 180 minutes and sufficient to reduce the magnetic susceptibility of said solid to a gram magnetic susceptibility below 1000×10^{-6}; and

(b) slowly cooling said solid at least to a temperature of 780° C in an oxidizing atmosphere at a rate of substantially 1° C to 30° per minute.

4,092,408

METHOD FOR SOLID PHASE IMMUNOLOGICAL ASSAY OF ANTIGEN

Gerald J. Litt, Wellesley, Mass., assignor to New England Nuclear Corporation, Boston, Mass.

Filed Aug. 28, 1975, Ser. No. 608,621

Int. Cl.[2] G01N *33/00;* **B01J** *1/22;* **A61K** *43/00*

U.S. Cl. 424—1 **10 Claims**

1. An improved method for solid phase immunological assay of an antigen comprising

(a) contacting anti-antiserum containing anti-antibody with a substrate surface capable of adsorbing said anti-antibody to form solid phase anti-antibody bound to said substrate surface

(b) incubating said solid phase anti-antibody while bound to said substrate with antiserum containing antibody to form solid phase antibody bound to said solid phase anti-antibody

(c) incubating said solid phase antibody, while bound to said solid phase anti-antibody and said substrate, with a solution containing antigen specific to said antibody and the same antigen labelled with a tracer, to form solid phase antigen and solid phase tracer-labelled antigen bound to said solid phase antibody and

(d) measuring the tracer activity either of said solid phase antibody-anti-antibody-substrate or of the remaining solution.

10. As an article of manufacture, a solid phase radioimmunological assay kit comprising a plurality of tubes having an internal substrate surface having bound thereto solid phase anti-antibody to which is bound solid phase antibody and a plurality of vials containing radioactive labelled antigen specific to said antibody, antigen standards, and a buffering solution.

4,092,409

METHOD FOR THE DIAGNOSIS OF VIRAL DISEASES

Joseph Zichis, Chicago, Ill., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Division of Ser. No. 112,039, Feb. 2, 1971, Pat. No. 3,777,014, which is a continuation-in-part of Ser. No. 786,770, Dec. 24, 1968, abandoned. This application Sep. 14, 1973, Ser. No. 397,253

Int. Cl.[2] G01N *31/00, 33/16*

U.S. Cl. 424—12 3 Claims

1. A seriological diagnostic slide test for viral diseases comprising the steps of:

obtaining an aliquot of human blood serum which is suspected to contain particular viral antibodies;

placing on a slide said aliquot of human blood serum in the presence of a viral antigen which is specific to the virus which produces said antibodies so that neutralization takes place on the slide between the viral antigen and the specific serum without visible agglutination;

then adding on the slide to said mixture an antigen prepared from erythrocytes characterized by being readily agglutinated by a virus, being free of hemoglobin, and being agglutinative with the viral antigen; and

observing the results, in the case of a positive test, the absence of agglutination, and in the case of a negative test, the presence of agglutination.

2. A serological diagnostic test for viral diseases comprising the steps of:

obtaining an aliquot of human blood serum which is suspected to contain particular viral antibodies;

placing said aliquot of human blood serum in the presence of a viral antigen which is specific to the virus which produces said antibodies so that neutralization takes place between the viral antigen and the specific serum without visible agglutination;

then adding to said mixture an antigen which is free of hemoglobin and agglutinative with the viral antigen, said antigen prepared by separating erythrocytes from animal or fowl blood to remove plasma and anticoagulant, treating the erythrocytes with an isotonic aqueous solution having a pH of about 7 and containing borate ions and boric acid and a preservative, incubating the resulting mixture of erythrocytes and isotonic solution at about 2° to about 4° C for about 8 to 23 days, and separating the resulting stable serologically active white-grayish antigen from the residual liquid and blood substances; and

observing the results, in the case of a positive test, the absence of agglutination, and in the case of a negative test, the presence of agglutination.

4,092,410

STABILIZATION OF PYRIDO[3,2-a]PHENOXAZINE COMPOUNDS

Kazumi Ogata, Toyonaka, and Shuzo Iwata, Kobe, both of Japan, assignors to Senju Pharmaceutical Co., Ltd., Osaka, Japan

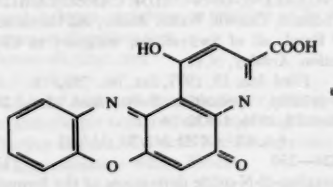
Filed Dec. 2, 1976, Ser. No. 746,717

Claims priority, application Japan, Dec. 5, 1975, 50-145450

Int. Cl.[2] A01N *9/00, 9/22;* C07D *265/00, 273/00*

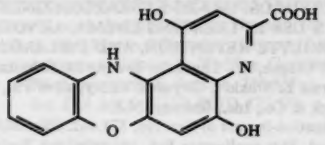
U.S. Cl. 424—78 6 Claims

1. A stabilized solution comprising an anti-cataract effective amount of a pyrido[3,2-a]phenoxazine compound of the formula:



or

-continued



and a stabilizer selected from the group consisting of ascorbic acid, isoascorbic acid and water-soluble salts thereof, wherein the concentration of the stabilizer in the solution is 0.01 to 20 W/V %, and the pH of the solution is 3 to 7.

4,092,411

ANTIBACTERIAL COMPOSITION

Hatsuo Aoki, Ikeda; Toyozi Nishiura, Toyonaka, and Hiroshi Imanaka, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Jun. 13, 1977, Ser. No. 806,147

Claims priority, application Japan, Jun. 18, 1976, 51-72458

Int. Cl.[2] A61K *35/00*

U.S. Cl. 424—114 3 Claims

1. An antibacterial composition comprising Nocardicin A and cycloserine or their pharmaceutically acceptable salts respectively in a ratio of 1:10 to 10:1 by weight.

4,092,412

TREATMENT OF HERPES SIMPLEX INFECTIONS

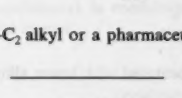
James Chieh-Hsia Mao, Libertyville; John Hunter Seely, Lake Forest, and John Scott Fairgrieve, Lake Villa, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 681,875, Apr. 30, 1976, abandoned. This application Apr. 14, 1977, Ser. No. 787,687

Int. Cl.[2] A61K *31/66*

U.S. Cl. 424—212 6 Claims

1. A method for treating herpes simplex virus infection in a warm-blooded animal which comprises administering to an animal so infected, an effective amount to combat said virus of a composition containing a carboxylic ester of phosphonoacetic acid of the formula



wherein R is a C_1–C_2 alkyl or a pharmaceutically acceptable salt thereof.

4,092,413

ANTIANDROGENS AS PLATELET AGGREGATION INHIBITORS

Glen E. Arth, Cranford, N.J., and Sumner Wood, Jr., deceased, late of Cranford (Linda S. Windsor Wood, administratrix), assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 446,171, Feb. 28, 1974, abandoned. This application Jun. 23, 1977, Ser. No. 809,512

Int. Cl.[2] C07J *71/00;* A61K *31/58*

U.S. Cl. 424—241 10 Claims

1. The method of inhibitng the aggregation of blood platelets in a mammal which comprises administering to said mammal a composition comprising an antiandrogenic compound which is an inhibitor of the biosynthesis or interconversion of androgens in admixture with a pharmacologically acceptable carrier, wherein said composition is in dosage unit form adapted for oral or injection administration to mammals, and contains an amount of the said inhibitor sufficient to provide a dosage level of about 0.1 – 20 milligrams of inhibitor per kilogram of body weight of said mammal.

4,092,414

3,4-DIHYDROSPIRO-2H-1,3-BENZOXAZINES AND THEIR USE IN TREATING EDEMA, ABNORMAL ELECTROLYTE RETENTION, AND INFLAMMATION

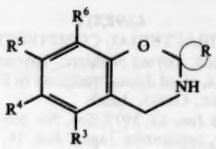
Edward J. Cragoe, Jr., Lansdale; Everett M. Schultz, Ambler, and Gerald E. Stokker, Gwynedd Valley, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 571,462, Apr. 25, 1975, abandoned. This application Feb. 19, 1976, Ser. No. 659,442

Int. Cl.[2] A01N *9/00, 9/22;* **C07D** *265/00, 273/00*

U.S. Cl. 424—248.51 **12 Claims**

1. A compound of formula:



wherein

R^3 is
- (1) hydrogen,
- (2) methyl,
- (3) chloro, or
- (4) methoxy;

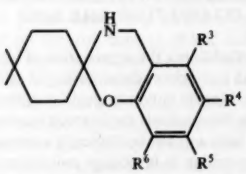
R^4 is
- (1) halo,
- (2) lower alkyl, or
- (3) adamantyl;

R^5 is
- (1) hydrogen,
- (2) lower alkyl,
- (3) lower alkoxy, or
- (4) halo;

R^6 is
- (1) halo,
- (2) lower alkyl,
- (3) lower alkylthio, or
- (4) trifluoromethyl;

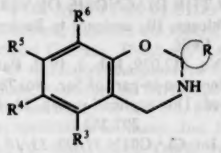
R^5 and R^6 taken together is —N=CH—CH=CH—, and

R is
- (1) a spiro-carbocycle of 5, 6, or 10–17 members, unsubstituted or substituted with
  - (a) lower alkyl,
  - (b) lower alkoxy,
  - (c) phenyl, or
  - (d) phenyl substituted with lower alkoxy, or
  - (e) lower alkanoyloxy;
- (2) a 6-membered spiroheterocycle containing 1 or 2 heteroatoms selected from oxygen, sulfur, and nitrogen wherein the nitrogen heteroatom can be substituted with lower alkyl, phenyl-lower alkyl, or lower alkanoyl;
- (3) a spiro-polycycloalkyl of 6–15 members, or



(4)

12. A pharmaceutical composition comprising a pharmaceutically acceptable carrier and a therapeutically effective amount of a compound of formula:



wherein

R^3 is
- (1) hydrogen,
- (2) methyl,
- (3) chloro, or
- methoxy;

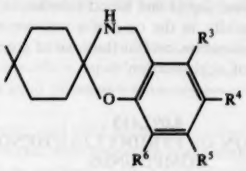
R^4 is
- (1) halo,
- (2) lower alkyl, or
- (3) adamantyl;

R^5 is
- (1) hydrogen,
- (2) lower alkyl,
- (3) lower alkoxy, or
- (4) halo;

R^6 is
- (1) halo,
- (2) lower alkyl,
- (3) lower alkylthio, or
- (4) trifluoromethyl;

R^5 and R^6 taken together is —N=CH—CH=CH—, and

R is
- (1) a spiro-carbocycle of 5, 6, or 10–17 members, unsubstituted or substituted with
  - (a) lower alkyl,
  - (b) lower alkoxy,
  - (c) phenyl, or
  - (d) phenyl substituted with lower alkoxy, or
  - (e) lower alkanoyloxy;
- (2) a 6-membered spiroheterocycle containing 1 or 2 heteroatoms selected from oxygen, sulfur, and nitrogen wherein the nitrogen heteroatom can be substituted with lower alkyl, phenyl-lower alkyl, or lower alkanoyl;
- (3) a spiro-polycycloalkyl of 6–15 members, or



(4)

4,092,415

MICROORGANISM COMBATTING QUINOXALINE-DI-N-OXIDE CARBOXAMIDES

Wolfgang Schmid, Therwil; Walter Basler, and Burckhardt, Urs, both of Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

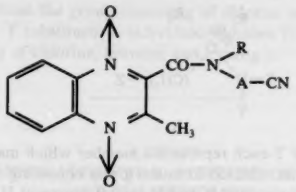
Filed Jan. 13, 1977, Ser. No. 758,973

Claims priority, application Switzerland, Jan. 20, 1976, 634/76; Nov. 26, 1976, 14920/76

Int. Cl.[2] C07D *241/52, 31/495*

U.S. Cl. 424—250 **12 Claims**

1. Quinoxaline-di-N-oxide derivatives of the formula I



wherein

R represents a hydrogen atom, an alkyl group of 1 to 12 carbon atoms, a cyanoalkyl group having 1 to 4 carbon atoms in the alkyl moiety or an allyl group, and

A represents a straight-chain or branched alkylene bridge member containing 1 to 4 carbon atoms.

10. A method of combatting pathogenic microorganisms, which comprises administering to the host afflicted with said microorganisms an effective amount of a compound of the formula I according to claim **1**.

12. A method of promoting the growth of domestic animals and productive livestock, which comprises administering to said animals and livestock an effective growth promoting amount of a compound of the formula I according to claim **1**.

4,092,416

BENZOPYRONE DERIVATIVES EXHIBITING ANTI-ALLERGIC ACTIVITY

Werner Winter, Heppenheim; Max Thiel, Mannheim, both of Germany; Kurt Stach, deceased, late of Mannheim-Waldhof, Germany; Andreniki Roesch, Mannheim; by Werner Plattner, administrator, Linz, Austria, and Wolfgang Schaumann, Heidelberg, both of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

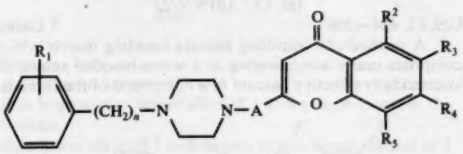
Filed Dec. 1, 1976, Ser. No. 746,551

Claims priority, application Germany, Dec. 9, 1975, 2555290

Int. Cl.[2] A61K *31/495;* **C07D** *295/10*

U.S. Cl. 424—250 **10 Claims**

1. A benzopyrone of the formula



wherein

R_1 is a hydrogen or halogen atom or hydroxyl, lower alkyl, alkoxy, alkylthio or trifluoromethyl,

R_2, R_3, R_4 and R_5 each independently is hydrogen, a halogen atom, hydroxyl, lower alkyl or lower alkoxy, or lower alkyl or lower alkoxy substituted by at least one of hydroxyl, halogen, mesyloxy or tosyloxy or by an oxirane, dioxane or dioxolane ring,

A is lower alkylene, and

n is 0, 1 or 2,

or a salt thereof with a pharmacologically compatible acid.

8. An anti-allergic composition comprising an anti-allergically effective amount of at least one benzopyrone according to claim **1**, in admixture with a diluent.

4,092,417

THEOPHYLLINE SALTS OF 5-METHYLISOXAZOLE-3-CARBOXYLIC ACID

Karl Credner, Kaarst; Joachim Göring, Gronau; Günter Brenner, Grefarth, and Manfred Tauscher, Gronau, Leine, all of Germany, assignors to Johann A. Wulfing, Germany

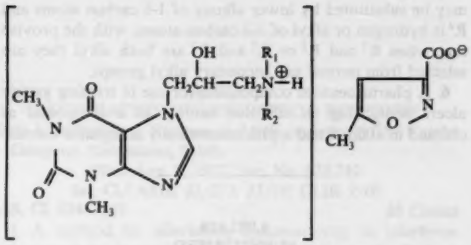
Filed Dec. 8, 1976, Ser. No. 748,507

Int. Cl.[2] A61K *31/52;* **C07D** *473/08*

U.S. Cl. 424—253 **37 Claims**

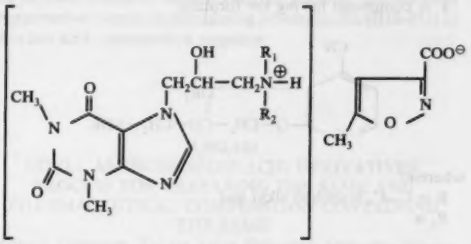
1. A salt of the formula:

(I)



in which each of R_1 and R_2 is independently selected from the group consisting of hydrogen, alkyl of up to 6 carbon atoms, hydroxyalkyl of up to 6 carbon atoms, alkoxyalkyl of up to 6 carbon atoms and cyclohexyl.

12. A pharmaceutical composition for humans comprising a hypolipidaemically effective amount of a salt of the formula:



in which each of R_1 and R_2 is independently selected from the group consisting of hydrogen, alkyl of up to 6 carbon atoms, hydroxyalkyl of up to 6 carbon atoms, alkoxyalkyl of up to 6 carbon atoms and cyclohexyl, in combination with a pharmaceutically acceptable carrier.

4,092,418

CERTAIN 1-CARBOTHIOAMIDES OF 1,5-NAPHTHYRIDINE DERIVATIVES

Adrian Charles Ward Curran, South Cave, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

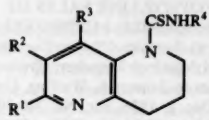
Continuation-in-part of Ser. No. 671,521, Mar. 29, 1976, abandoned, which is a continuation-in-part of Ser. No. 553,964, Feb. 28, 1975, Pat. No. 3,960,876. This application Apr. 7, 1977, Ser. No. 785,637

Claims priority, application United Kingdom, Mar. 5, 1974, 9764/74; Jul. 12, 1974, 30935/74

Int. Cl.[2] A61K *31/435;* **C07D** *471/04*

U.S. Cl. 424—256 **8 Claims**

1. A compound of formula (I)



(I)

or a pharmaceutically acceptable acid addition salt thereof wherein R^1, R^2 and R^3 are the same or different and represent a hydrogen atom or lower alkyl of 1-6 carbon atoms which may be substituted by lower alkoxy of 1-6 carbon atoms and R^4 is hydrogen or alkyl of 1-3 carbon atoms, with the proviso that when R^1 and R^2 or R^2 and R^3 are both alkyl they are selected from normal and secondary alkyl groups.

6. A pharmaceutical composition for use in treating gastric ulcers comprising an effective amount of a compound as claimed in claim 1 and a pharmaceutically acceptable carrier.

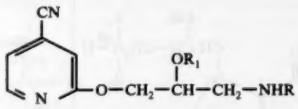
4,092,419

SUBSTITUTED (3-LOWERALKYLAMINO-2-R_1O-PROPOXY)PYRIDINES, THEIR PREPARATION AND USE

John J. Baldwin, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 696,235, Jun. 15, 1976. This application Mar. 7, 1977, Ser. No. 774,849
Int. Cl.[2] C07D *213/57*; A61K *31/44*
U.S. Cl. 424—263 **9 Claims**

1. A compound having the formula:



wherein:

R is C_3–C_4 branched alkyl and

R_1 is

wherein L is selected from C_1–C_{10} alkyl, phenyl, mono and disubstituted phenyl wherein said substituents are independently selected from C_1–C_4 alkyl, C_1–C_4 alkoxy and halo, and pharmaceutically acceptable salts thereof.

8. A method of treating hypertension in animals which comprises administering an effective amount of a compound of claim 1.

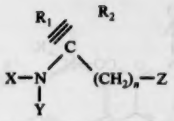
4,092,420

NOVEL SOFT N-CHLOROAMINO ALCOHOL DERIVATIVES EXHIBITING ANTIBACTERIAL ACTIVITY

James J. Kaminski, and Nicolae S. Bodor, both of Lawrence, Kans., assignors to INTERx Research Corporation, Lawrence, Kans.

Division of Ser. No. 632,012, Nov. 14, 1975, Pat. No. 4,036,843. This application Jun. 6, 1977, Ser. No. 803,867
Int. Cl.[2] A61K *31/44*
U.S. Cl. 424—263 **20 Claims**

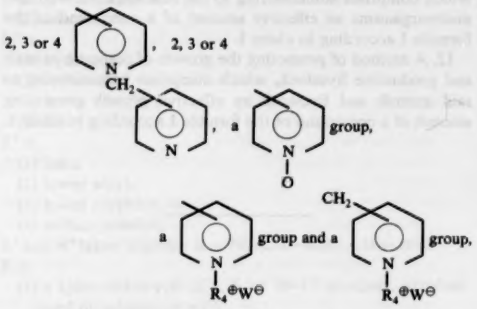
1. A method for inhibiting bacterial growth which comprises applying to said bacterial growth, an antibacterially effective amount of a compound having the formula:



(I)

wherein X and Y each represent a member which may be the same or different selected from the group consisting of H and Cl with the proviso that X and Y cannot represent H simultaneously; R_1 and R_2 each represent a member which may be the same or different selected from the group consisting of *n*- or branched alkyl of from 1 to 20 carbon atoms, phenyl or naphthyl and $(CH_2)_m$,

wherein *m* represents an integer of from 2 to 5; *n* represents an integer of 1 to 8; and Z represents —$OOCR_3$, wherein R_3 represents a member selected from the group consisting of



wherein R_4 represents a member selected from the group consisting of H, *n*- or branched alkyl of from 1 to 3 carbon atoms, benzyl and —$(CH_2)_pCOOH$, wherein *p* represents an integer of 1 to 4, and wherein W^θ represents a nontoxic pharmaceutically acceptable inorganic or organic anion.

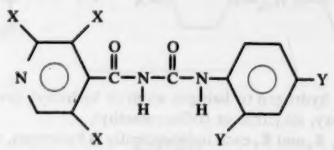
4,092,421

METHOD OF CONTROLLING MANURE-BREEDING INSECTS

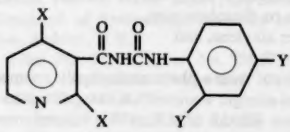
Lisby Lucius Wade, and Muriel McDermott, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 13, 1977, Ser. No. 796,648
Int. Cl.[2] A01N *9/22*
U.S. Cl. 424—266 **7 Claims**

1. A method of controlling manure-breeding insects which comprises orally administering to a warm-blooded animal an insecticidally-effective amount of a compound of the formula



or of the formula



wherein, in both formulas, each X substituent is individually selected from the group consisting of chlorine and hydrogen; and each Y substituent is individually chosen from the group consisting of chlorine, bromine and hydrogen.

4,092,422

SYNERGISTIC FUNGICIDAL MIXTURE OF CAPTAFOL AND THIABENDAZOL

Alois Mayr, Munich; Max Königer, Rothschwaige, and Gustav Obermayer, Munich, all of Germany, assignors to Consortium fur Elektrochemische Industrie GmbH, Munich, Germany

Filed Mar. 26, 1976, Ser. No. 670,815

Claims priority, application Germany, Apr. 3, 1975, 2514460

Int. Cl.[2] A01N *9/12, 9/22, 9/02*

U.S. Cl. 424—270 3 Claims

1. A method for combatting stem diseases and spike or ear diseases in crops of cereals and corn, which comprises applying to said crops a synergistic fungicide mixture containing as active substances from 50 to 90% by weight of N-(1,1,2,2-tetrachloroethylthio)-3a,4,7,7*a*-tetrahydrophthalimide and from 50 to 10% by weight of 2-(4'-thiazolyl)-benzimidazole, in conjunction with a diluant.

4,092,423

ALKOXY ANILIDES AND PHARMACEUTICAL COMPOSITIONS

Charles Malen, Fresnes; Pierre Roger, St-Cloud; Jean-Claude Poignant, Bures, Yvette, and Xavier Pascaud, Paris, all of France, assignors to Science Union et Cie., Societe Francaise de Recherche Medicale, Suresnes, France

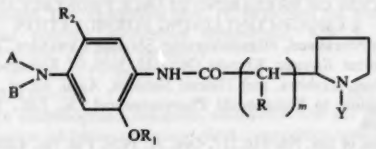
Division of Ser. No. 558,043, Mar. 13, 1975, Pat. No. 3,989,834. This application Sep. 16, 1976, Ser. No. 723,684

Claims priority, application United Kingdom, Mar. 18, 1974, 11868/74

Int. Cl.[2] C07D *207/04;* A61K *31/40*

U.S. Cl. 424—274 6 Claims

1. A compound of the formula



wherein:

m is O or an integer of 1 to 4

R is hydrogen or lower alkyl of 1 to 6 carbon atoms in the chain;

R_1 is lower alkyl of 1 to 6 carbon atoms, lower alkenyl of 2 to 6 carbon atoms,

or phenyl lower alkyl of 1 to 4 carbon atoms in the side chain;

R_2 is halo or lower alkoxy of 1 to 6 carbon atoms;

Y is a lower alkyl of 1–6 carbon atoms;

A and B which may be the same or different, each represents a hydrogen atom, a lower alkyl radical or an acyl radical derived from an organic carboxylic acid having from 1 to 18 carbon atoms.

3. Pharmaceutically active compositions for suppressing gastric hypersecretion and/or preventing delay in gastric evacuation comprising, as active ingredients, a safe and effective amount of at least one compound of claim 1, in the free form or in the form of a salt, in admixture or conjunction with an inert pharmaceutical excipient.

4,092,424

ANTIBIOTIC DERIVATIVES

Ernst Brandl; Franz Knauseder, both of Tyrol, and Franz Rembold, Vienna, all of Austria, assignors to Biochemie Ges.m.b.H., Vienna, Austria

Division of Ser. No. 660,206, Aug. 14, 1967, Pat. No. 3,949,079. This application Sep. 11, 1975, Ser. No. 612,321

Claims priority, application Australia, Apr. 17, 1964, 3402/64

Int. Cl.[2] C07C *69/66;* A61K *31/225*

U.S. Cl. 424—299 6 Claims

1. The succinate of pleuromutilin.

4,092,425

RESTORATION OF INTERFERON RESPONSE

Dale A. Stringfellow, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 8, 1977, Ser. No. 822,742

Int. Cl.[2] A61K *31/215, 31/19;* C12K *9/00*

U.S. Cl. 424—305 35 Claims

1. A method for alleviating hyporeactivity to interferon induction in interferon-producing animals or animal cells having a hyporeactive interferon response which comprises administering to said animal or animal cells an effective amount of a hyporeactive interferon stimulating prostaglandin (HIS-PG) to alleviate said hyporeactive response.

35. A method for alleviating a hyporeactive interferon response in interferon-producing human or animal cells having a hyporeactive interferon response which comprises administering to said human or animal cells an effective amount of a hyporeactive interferon stimulating prostaglandin (HIS-PG) to alleviate said hyporeactive response.

4,092,426

NOVEL AMINOBENZOIC ACID DERIVATIVES, PROCESS FOR PREPARING THE SAME AND PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

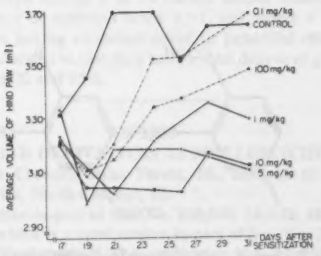
Mitsuru Tanemura, Tokyo; Teizo Shinozaki, Matsudo; Minoru Shindo, Kurume; Shun-ichi Hata, Yokohama; Koji Mizuno; Masayoshi Ono, both of Tokorozawa; Kiyoshige Wakabayashi, Ohmiya; Toshiaki Nakano, Tokyo; Yasuho Nishii, Niiza; Takashi Matsuno, Ohmiya, and Yoshiyuki Ohsugi, Kodaira, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 1, 1976, Ser. No. 691,432

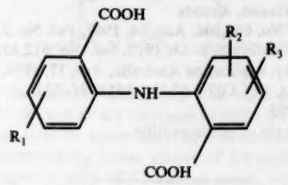
Claims priority, application Germany, Jun. 11, 1975, 2526092; Japan, Apr. 12, 1976, 51-41041

Int. Cl.[2] A01N *9/20;* C07C *63/33*

U.S. Cl. 424—309 22 Claims

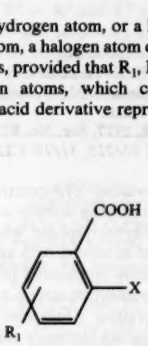


1. A process for preparing an aminobenzoic acid derivative represented by the formula



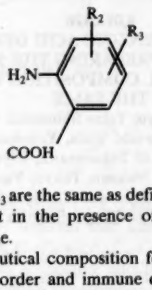
(I)

wherein R_1 is a hydrogen atom, or a halogen atom, R_2 and R_3 are a hydrogen atom, a halogen atom or an alkyl radical having 1 – 6 carbon atoms, provided that R_1, R_2 and R_3 are not simultaneously hydrogen atoms, which comprises reacting a 2-halogenobenzoic acid derivative represented by the formula



(II)

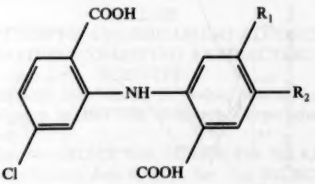
wherein R_1 is the same as defined above and X is a halogen atom with anthranilic acid or its derivative represented by the formula



(III)

wherein R_2 and R_3 are the same as defined above, said reaction being carried out in the presence of an alkaline substance, copper, and iodine.

2. A pharmaceutical composition for treating disease from liver function disorder and immune depletion comprising an amount sufficient therefor of an aminobenzoic acid derivative of the formula



wherein R_1 and R_2 are independently hydrogen, methyl or chloro, provided that at least one of R_1 and R_2 is hydrogen, or an alkali salt thereof, and a pharmaceutically acceptable carrier and adjuvant.

4,092,427

METHOD OF INDUCING ABORTION USING ALKYL DERIVATIVES OF PROSTANOIC ACIDS

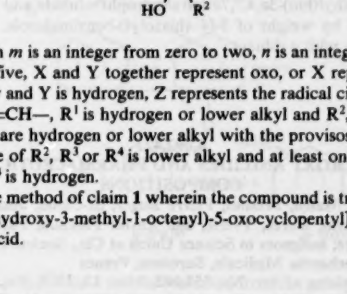
Nedumparambil A. Abraham, Dollard des Ormeaux; Jehan F. Bagli, Kirkland, and Tibor Bogri, Montreal, all of Canada, assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 578,593, May 19, 1975, abandoned, which is a continuation-in-part of Ser. No. 351,381, Apr. 16, 1973, Pat. No. 3,917,668. This application Jun. 15, 1976, Ser. No. 696,245

Int. Cl.[2] A61K *31/19, 31/215*

U.S. Cl. 424—317 **2 Claims**

1. A method for inducing abortion which comprises administering to a pregnant host an effective amount of a compound of formula



in which *m* is an integer from zero to two, *n* is an integer from two to five, X and Y together represent oxo, or X represents hydroxy and Y is hydrogen, Z represents the radical cis—CH_2—CH=CH—, R^1 is hydrogen or lower alkyl and R^2, R^3 and R^4 each are hydrogen or lower alkyl with the provisos that at least one of R^2, R^3 or R^4 is lower alkyl and at least one of R^2, R^3 or R^4 is hydrogen.

2. The method of claim 1 wherein the compound is trans,cis-7-[2-(3-hydroxy-3-methyl-1-octenyl)-5-oxocyclopentyl]-4-heptenoic acid.

4,092,428

PROCESS OF PREPARING STABLE PROSTAGLANDIN E GROUP-CONTAINING FORMULATION

Masuo Murakami, Higashikurume; Shigemi Kawahara, Tokyo; Hiroitsu Kawata; Kiyoshi Okazaki, both of Kawagoe; Jun Sekino, Kashiwa, and Hidemi Shimizu, Ageo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Division of Ser. No. 516,217, Oct. 21, 1974, Pat. No. 4,036,954. This application Mar. 7, 1977, Ser. No. 774,680

Claims priority, application Japan, Nov. 2, 1973, 48-123669; June 25, 1974, 49-72585

Int. Cl.[2] A61K *31/19, 31/215*

U.S. Cl. 424—317 **11 Claims**

1. A process of preparing a stable prostaglandin E-containing formulation which comprises adding to prostaglandin E_1, E_2 or E_3 at least one member selected from the group consisting of an arginine salt, a lysine salt and an alkali metal salt of deoxycholic acid and subjecting the resulting mixture to lyophilization, said arginine salt, lysine salt or alkali metal salt of deoxycholic acid being present in an amount varying between 1 to 200 mg. per 0.05 mg. of said prostaglandin E.

8. A lyophilized pharmaceutical composition comprising as the active ingredient a therapeutically effective amount of prostaglandin E_1, E_2 or E_3 and at least one member selected from the group consisting of an arginine salt, a lysine salt and alkali metal salts of deoxycholic acid, said arginine salt, lysine salt and alkali metal salts of deoxycholic acid being present in an amount from 1 to 200 mg. per 0.05 mg. of said prostaglandin E.

4,092,429
(TETRACHLORO-FLUORO-ETHYL-THIO)N-PHENYL SULFONAMIDES AND THEIR USE IN CONTROLLING PESTS

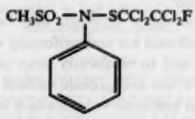
Peter F. Epstein, Overland Park, Kans., and Willis C. McGuire, Lafayette, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 657,020, Feb. 9, 1976, abandoned, which is a continuation of Ser. No. 561,735, Mar. 24, 1975, abandoned, which is a continuation of Ser. No. 452,583, Mar. 19, 1974, abandoned, which is a continuation of Ser. No. 371,076, Jun. 18, 1973, abandoned, which is a continuation of Ser. No. 219,188, Jan. 19, 1972, abandoned, which is a continuation of Ser. No. 69,941, Sep. 4, 1970, abandoned, which is a division of Ser. No. 672,969, Oct. 5, 1967, abandoned, which is a continuation-in-part of Ser. No. 512,781, Dec. 9, 1965, abandoned. This application Jan. 21, 1977, Ser. No. 761,192

Int. Cl.² A01N *9/16*

U.S. Cl. 424—321 **2 Claims**

1. A method of controlling acarids comprising applying thereto an acaricidally effective amount of the compound of the formula



4,092,430
ANTIPHLOGISTIC PHENYLACETOHYDROXAMIC ACID COMPOSITIONS

Alfred Sallmann, Bottmingen, and Rudolf Pfister, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

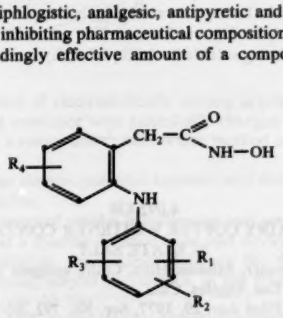
Continuation of Ser. No. 467,366, May 6, 1974, abandoned, which is a continuation-in-part of Ser. No. 177,088, Sep. 1, 1971, abandoned. This application Mar. 11, 1976, Ser. No. 665,986

Claims priority, application Switzerland, Sep. 9, 1970, 13415/70; Jul. 16, 1971, 10580/71

Int. Cl.² A61K *31/165, 31/185, 31/16*

U.S. Cl. 424—324 **10 Claims**

1. An antiphlogistic, analgesic, antipyretic and the platelet aggregation inhibiting pharmaceutical composition comprising a correspondingly effective amount of a compound of the formula



wherein each of R_1, R_3 and R_4 represents hydrogen, lower alkyl, lower alkoxy, or halogen up to and including atomic number 35, and R_2 represents hydrogen, lower alkyl, lower alkoxy, halogen up to and including atomic number 35, or trifluoromethyl, with exclusion of the simultaneous definition of the substituents R_1, R_2 and R_3 as hydrogen, or a pharmaceutically acceptable salt thereof, together with a pharmaceutical carrier therefor.

4,092,431
PHARMACEUTICAL COMPOSITION AND METHOD OF THE USE THEREOF

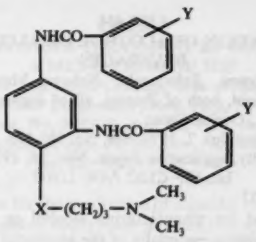
Takashi Mori, Tama; Sakae Takaku, Ageo; Nobuhiro Oi, Hoya; Minoru Shindo, Higashikurume; Takeaki Hirano, Fujimi; Shigeyuki Kataoka, Iruma, and Kouji Furuno, Kokubunji, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 612,500, Sep. 11, 1975, Pat. No. 4,038,416. This application Apr. 28, 1977, Ser. No. 791,889

Int. Cl.² A61K *31/165*

U.S. Cl. 424—324 **17 Claims**

1. A pharmaceutical composition for prevention and treatment of peptic ulcer and gastritis of a mammal including human being comprising a bis(benzamido)-benzene derivative represented by the formula



wherein X is —CONH— and Y is methyl attached to o- or m-position of benzene nucleus, or an acid addition salt thereof, in an amount sufficient to prevent and treat the gastritis and peptic ulcer and a pharmaceutically acceptable carrier.

4,092,432
MIXTURES HAVING ANTIMICROBIAL OR PESTICIDAL EFFECT

Christer James Axel Björklund, Saltsjo-Boo, and Alf Ragnar Reuterhäll, Sundsvall, both of Sweden, assignors to Kema-Nord AB, Stockholm, Sweden

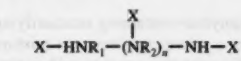
Filed Oct. 22, 1976, Ser. No. 734,927

Claims priority, application Sweden, Oct. 22, 1975, 7511852

Int. Cl.² A61K *31/155;* C07C *129/08;* A01N *9/20*

U.S. Cl. 424—326 **5 Claims**

1. Mixtures of guanidated aliphatic polyamines having the general formula



or their acid addition salts, wherein X is hydrogen or a carboxamidine group, optionally substituted with alkyl groups having 1 to 4 carbon atoms, R_1 and R_2 independent of each other are aliphatic groups having 3 to 14 carbon atoms, whereby the groups R_2 may be different when $n>1$, and where $n = 1$–6, said mixtures having an antimicrobial or pesticidal effect and being characterized in that they have a total degree of guanidation between 70 and 95%.

4,092,433
QUINONE DERIVATIVES AS MOLLUSCICIDES

Aldo Joseph Crovetti, Lake Forest, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

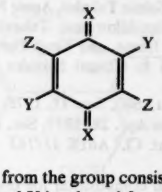
Continuation-in-part of Ser. No. 665,040, Mar. 8, 1976, abandoned, which is a continuation-in-part of Ser. No. 365,821, May 31, 1973, abandoned. This application Nov. 10, 1976, Ser. No. 740,447

Int. Cl.² A01N *9/24*

U.S. Cl. 424—331 **8 Claims**

1. A method for the control of mollusks which comprises

treating a mollusk with an effective molluscicidal amount of a compound of the formula:



where Z is selected from the group consisting of hydrogen and halo; X is oxygen; and Y is selected from the group consisting of halo, loweralkyl and hydrogen.

4,092,434

PREPARATION OF ALCOHOL OR ALCOHOLIC BEVERAGES

Hajime Yoshizumi, Takatsuki; Nobuya Matsumoto, and Osamu Fukushi, both of Ibaragi, all of Japan, assignors to Suntory Ltd., Osaka, Japan

Filed Jul. 7, 1975, Ser. No. 593,479

Claims priority, application Japan, Nov. 26, 1974, 49-136813

Int. Cl.[2] C12C *7/04, 11/08*

U.S. Cl. 426—13 **8 Claims**

1. A method for manufacturing alcohol or an alcoholic beverage, consisting essentially of the sequential steps of:

(a) adding water or a mixture of water and stillage to (i) ground maize or (ii) milomaize, or to (III) ground maize or (IV) milomaize in admixture with ground cereal selected from the group consisting of rice, barley, wheat, barnyard millet, common millet and Italian millet, over 30% of which pass through 20 mesh, to obtain a slurry containing from 13 to 40% by weight of solid contents;

(b) heating said slurry with malt or an α-amylase-containing liquefying enzyme preparation from microorganisms or a mixture thereof at a temperature of from 75° C. to 85° C. which is lower than the temperature of maximum viscosity for the slurry and which is higher than the sterilization temperature of undesirable microorganisms therein which can grow during yeast fermentation, and maintaining said slurry at said temperature of from 75° C. to 85° C. for from 1 to 30 minutes to cause incomplete liquefaction and partial gelatinization of starch therein;

(c) cooling said slurry to a temperature of from 25° C. to 34° C.;

(d) adding malt or a glucoamylase-containing saccharifying enzyme preparation from a microorganism or a mixture thereof, and an alcohol fermentative yeast to said cooled slurry;

(e) fermenting the resulting slurry; and

(f) distilling the resulting fermented mash; wherein at least said a-amylase-containing liquefying enzyme preparation is present in (b) or said glucoamylase-containing saccharifying enzyme preparation is present in (d).

4,092,435

SHRIMP PRODUCT AND PROCESS

Joseph M. Teijeiro, Miami, Fla., assignor to JTX Systems, Inc., N. Miami Beach, Fla.

Filed Jul. 7, 1975, Ser. No. 593,479

Int. Cl.[2] A23P *1/00*

U.S. Cl. 426—296 **9 Claims**

1. An edible shrimp product resembling whole shrimp in appearance, taste and texture, comprising a coherent, shaped agglomerate of shrimp flakes containing a small amount of sodium tripolyphosphate and being substantially free of any added binder or filler.

4,092,436

METHOD OF STEAM-STRIPPING ROAST AND GROUND COFFEE OR TEA

Dennis L. MacDonald, West Lafayette, Ind., and James August Weikel, Forest Park, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 6, 1976, Ser. No. 747,572

Int. Cl.[2] A23F *1/00, 3/00*

U.S. Cl. 426—478 **16 Claims**

1. A method of stripping essential volatiles from roast and ground coffee comprising the steps of:

(a) cooling substantially dry roast and ground coffee to a temperature of at least that approximating the freezing point of water;

(b) admixing finely ground ice with said roast and ground coffee in an amount sufficient to maintain substantially said temperature and to form a substantially melt-free and uniform admixture wherein said admixture has a ratio of roast and ground coffee to ground ice on a weight basis of from about 2:1 to about 10:1;

(c) forming a bed of said admixture in a suitable sealed vessel at a pressure effective to allow water vapor to pass through said bed;

(d) passing water vapor through said bed in an amount sufficient to melt said ice and uniformly wet said roast and ground coffee and to uniformly strip said essential volatiles from said roast and ground coffee; and

(e) collecting said essential volatiles in a cold trap.

4,092,437

METHOD OF CANNING FOODS

Antonius Bernardus Claasen, Sperwerlaan 4, Leende, Netherlands

Filed Oct. 12, 1976, Ser. No. 731,835

Claims priority, application Netherlands, Oct. 13, 1975, 7512017

Int. Cl.[2] A23L *1/04, 1/218, 1/221*

U.S. Cl. 426—573 **6 Claims**

1. In a method of packing foods wherein an edible liquid is added to overflowing to a solid food product containing at least one herb and/or spice within a container and the container is sealed, the improvement which comprises adding the herb and/or spice dispersed in an edible gel to the food product, said gel being soluble in the liquid component of the food product.

4,092,438

NON-DAIRY COFFEE WHITENER CONTAINING ACETATE SALT

George F. Tonner, Mission Hills, Calif., assignor to Carnation Company, Los Angeles, Calif.

Filed Apr. 29, 1977, Ser. No. 792,205

Int. Cl.[2] A23D *5/00*

U.S. Cl. 426—601 **13 Claims**

1. In a non-dairy coffee whitener containing fat, protein, carbohydrate, emulsifier and an amount of stabilizing salt sufficient to stabilize the whitener to the thermal and acid stresses of coffee without imparting an undesirable taste or flavor to the whitener, the improvement wherein at least a portion of the stabilizing salt is an effective amount of a water soluble acetate salt.

4,092,439

PROCESS FOR OBTAINING CHROMIUM DIOXIDE CRO_2

Gérard Demazeau, Gradignan; Patrick Maestro, Le Bouscat; Théophile Plante, Pessac; Michel Pouchard, Blanquefort, and Paul Hagenmuller, Talence, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Filed Oct. 7, 1976, Ser. No. 730,389

Claims priority, application France, Oct. 10, 1975, 75 31056; Sep. 30, 1976, 76 29472

Int. Cl.[2] C01G *37/02*

U.S. Cl. 423—607 13 Claims

1. A process for obtaining pure chromium dioxide, consisting essentially of:

oxidizing hydrated trivalent chromium oxide of the formula $Cr_2O_3 . xH_2O$, wherein x is at least 1, at a temperature of at least 350° C and at pressures of at least 2 kilobars, in an oxidizing medium which is a solid or an aqueous liquid solution, containing an oxidizing agent of a compound of the formula $HXOy . zH_2O$, wherein X represents chlorine or iodine, y is a positive integer up to and including 4, and z is a number which is a function of the dilution of said oxidizing compound in the solution or a function of the crystallization water in the case of a solid oxidizing agent.

4,092,440

METHOD FOR ELECTROSTATIC COATING OF ARTICLES WITH POWDERED MATERIAL UNDER ELECTRIC FIELD STRENGTH LIMITATION

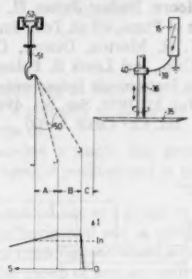
Rolf Wöhr, Leonberg, and Gerhard Gulich, Stuttgart, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 28, 1975, Ser. No. 626,109

Claims priority, application Germany, Oct. 31, 1974, 2451818

Int. Cl.[2] B05B *5/04*

U.S. Cl. 427—33 5 Claims



1. A method of electrostatically coating articles supported by a moving conveyor with electrically charged powder dispensed from a rotary disk device, which method comprises the steps of:

applying an electric potential between said disk device and said articles;

moving a series of articles in succession past said rotary disk device at a spacing distance from said device by driving said conveyor, the distance between the disk and the article being subject to variation as the articles are thus moved past the disk;

regulating said applied electric potential so that for a spacing between the disk device and an article being coated greater than a first predetermined spacing distance at which the current flow produced by the transport of charged powder is less than a predetermined value, the voltage between said disk device and said articles remains constant and the current flow produced by the transport of charged powder therefore increases with decreased spacing, and so that for any spacing between said disk device and an article being coated which is less than said first predetermined distance and not less than a second predetermined spacing distance said current flow is maintained at substantially the same value and said applied potential therefore decreases with decreasing spacing, said second predetermined spacing distance being determined substantially as that for which said applied potential is reduced to a predetermined value, and

switching off said potential when the spacing between said disk device and said article being coated becomes less than said second predetermined spacing distance as determined by reduction of said applied potential to substantially said predetermined value thereof.

4,092,441

ROOFING GRANULE TREATMENT BY COATING WITH A METALLIC ALGICIDE

John E. Meyer, and David C. Little, both of Hagerstown, Md., assignors to GAF Corporation, New York, N.Y.

Division of Ser. No. 392,930, Aug. 30, 1973, abandoned. This application Jun. 20, 197, Ser. No. 808,100

Int. Cl.[2] B05D *1/00, 1/08*

U.S. Cl. 427—37 9 Claims

1. A process for the production of algicidal roofing granules having an enhanced ability, over an extended period of time, to leach algicidal ions to inhibit or prevent the growth of discoloring algae and fungi organisms upon atmospheric exposure of roofing surfaces containing such granules, comprising spraying metal algicides in the form of droplets of molten metal onto essentially dry roofing granules, said granules comprising base mineral granules having a size range between about 40 and about 8 mesh coated with a moisture permeable, water insolubilized, pigmented, fired inorganic alkali metal silicateclay coating, said metal algicides adhering to the surface of said granules in the form of very fine, irregularly shaped, randomly distributed solidified globules having a random size range from submicron to about 100 mesh,

whereby said globules become oxidized and are capable of slowly releasing metallic algicidal ions upon exposure to moisture during atmospheric weathering, said ions thus being leached over the roofing surfaces in which said granules are employed to retard or prevent the growth of algae and fungi.

4,092,442

METHOD OF DEPOSITING THIN FILMS UTILIZING A POLYIMIDE MASK

Ram Kumar Agnihotri, Wappingers Falls, and Herman Carl Kluge, II, Fishkill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1976, Ser. No. 755,877

Int. Cl.[2] B05D *3/06*

U.S. Cl. 427—41 9 Claims

1. A method of forming a patterned thin film on a substrate comprising:

depositing said thin film onto said substrate;

forming on said thin film a polyimide layer;

forming a resist layer on said polyimide layer;

forming openings through said resist and polyimide layers extending to said thin film, thereby exposing selected portions of said thin film; and

removing the exposed thin film by plasma etching, using said polyimide as a mask, whereby the remaining thin film is in the desired pattern.

4,092,443

METHOD FOR MAKING REINFORCED COMPOSITES

George Edward Green, Stapleford, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 10, 1977, Ser. No. 767,268
Claims priority, application United Kingdom, Feb. 19, 1976, 6528/76; Feb. 19, 1976, 6575/76
Int. Cl.[2] B05D *3/06*
U.S. Cl. 427—53 11 Claims

1. A method for the preparation of prepregs which comprises

i. impregnating a fibrous reinforcing material with a liquid composition containing an epoxide resin and a photopolymerisable compound which is an acrylic ester containing, attached to an organic group of at least 5 carbon atoms, at least one group of formula

$$CH_2{=}C(R^3)COO{-}$$

or

$$(CH_2{=}C(R^3)CONH)_2{-}CHCOO$$

or

$$CH_2{=}C(R^3)CONHCH(OH)CH_2COO{-}$$

wherein R^3 is a hydrogen, chlorine, or bromine atom or an alkyl hydrocarbon group of 1 to 4 carbon atoms, in the molar ratio of from 1:10 to 10:1, and with a heat-activated curing agent for epoxide resins, and

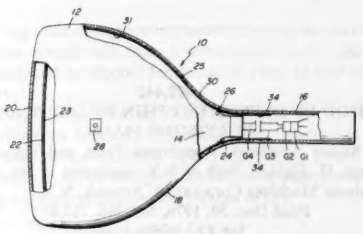
ii. in the absence of a substance which gives rise to a substantial degree of photoinduced polymerisation through consumption of epoxide groups, exposing the impregnated material to actinic radiation such that the composition solidifies due to photopolymerisation of the said photopolymerisable compound while the epoxide resin remains substantially in the thermosettable state.

4,092,444

CATHODE RAY TUBE HAVING AMORPHOUS RESISTIVE FILM ON INTERNAL SURFACES AND METHOD OF FORMING THE FILM

Kurt B. Kilichowski, Burlington, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 24, 1975, Ser. No. 634,675
Int. Cl.[2] B05D *1/28, 1/02*
U.S. Cl. 427—64 10 Claims



1. A method of forming a resistive thin film on an internal portion of a cathode ray tube to reduce arcing comprising the steps of:

a. coating the internal portion with a liquid consisting of graphite in a carrier of isopropyl alcohol and effective proportions of a heavy metal resinate selected from the group consisting of antimony and tin resinates and combinations thereof, and

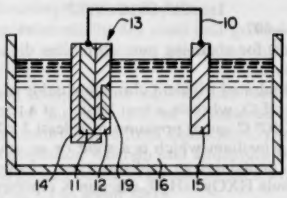
b. heating the coated liquid to produce an amorphous resistive thin film which is a mixture of graphite and oxides of the heavy metal.

4,092,445

PROCESS FOR FORMING POROUS SEMICONDUCTOR REGION USING ELECTROLYTE WITHOUT ELECTRICAL SOURCE

Naobumi Tsuzuki; Tetsu Koji, and Kazuo Noguchi, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Nov. 4, 1976, Ser. No. 738,874
Claims priority, application Japan, Nov. 5, 1975, 50-133499
Int. Cl.[2] B05D *5/12*
U.S. Cl. 427—85 16 Claims



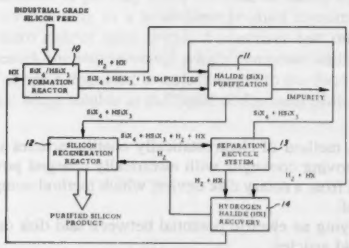
1. A process for forming a porous semiconductor comprising the steps of forming a high-concentration region having an impurity concentration of $1 \times 10^{17}\,cm^{-3}$ to $1 \times 10^{22}\,cm^{-3}$ in a desired area at a surface of a single crystal semiconductor body, said surface region having an impurity concentration of below $1 \times 10^{17}\,cm^{-3}$; placing said semiconductor body and an electrode into an electrolyte; and directly connecting said semiconductor body to said electrode, thereby converting said high-concentration region into a porous region.

4,092,446

PROCESS OF REFINING IMPURE SILICON TO PRODUCE PURIFIED ELECTRONIC GRADE SILICON

Francois A. Padovani, Dallas; Michael Brant Miller, Richardson; James A. Moore, Dallas; James H. Fowler; Malcolm Neville June, both of Plano, all of, Tex.; James D. Matthews, Denver, Colo.; T. R. Morton, Denver, Colo.; Norbert A. Stotko, Denver, Colo., and Lewis B. Palmer, Denver, Colo., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 31, 1974, Ser. No. 494,005
Int. Cl.[2] C01B *33/00*
U.S. Cl. 427—213 5 Claims



1. A method of refining impure silicon to produce purified electronic grade silicon comprising the steps of:

(a) charging a stream of a hydrogen halide through a bed of impure silicon particles in a first reaction zone to produce a first impurity containing effluent stream of halosilane and/or silicon halide and a second effluent stream comprised of hydrogen;

(b) passing said first effluent stream from said first reaction zone to a purification zone to remove the impurities therefrom and produce a third effluent stream of purified halosilane and/or silicon halide;

(c) passing said second effluent stream from said first reac-

tion zone to a separation zone to remove the hydrogen therefrom and produce a hydrogen stream;

(d) charging said third effluent stream and said stream of hydrogen through a bed of purified electronic grade silicon seed particles in a second reaction zone to deposit electronic grade silicon product on said seed particles and a fourth effluent stream comprised of hydrogen halide;

(e) passing said fourth effluent stream from said second reaction zone to a separation zone to remove said hydrogen halide and passing said hydrogen halide stream to said first reaction zone; and

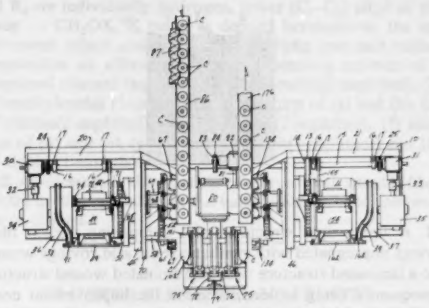
(f) recovering said deposited electronic grade silicon product from said second reaction zone.

4,092,447

COATING APPARATUS INCLUDING TRANSFER MEANS

Judson G. Frederick; Benjamin Mercer, Jr., both of Toledo, and John E. Poole, Holland, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Jun. 13, 1977, Ser. No. 806,138
Int. Cl.[2] B05D *1/00*; B65G *47/56*
U.S. Cl. 427—286 **9 Claims**



1. Method for applying an encircling coating on a selected portion of each of a plurality of generally cylindrical articles comprising the steps of:

continuously moving a single line group of said articles which are in upright position and at spaced intervals to a first position;

transferring the spaced line as a group to a supporting turret with their axes horizontal and in vertical alignment;

indexing the turret through 90° about a horizontal axis while maintaining the group of articles with their axes horizontal and in vertical alignment;

rotating each article in said turret about its own axis;

applying a coating material to the group of articles while supported and rotated in said turret;

removing said single spaced line as a group from the turret and moving said group to an upright position; and

releasing said group of articles to a means for carrying the group from the coating process.

4,092,448

METHOD OF PLATING METALS

Miguel Coll-Palagos, Rye, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 569,526, Apr. 18, 1975, abandoned. This application Nov. 22, 1976, Ser. No. 743,551
Int. Cl.[2] C25D *5/50*
U.S. Cl. 427—383 D **6 Claims**

1. A method of plating an aluminum substrate comprising:

coating said aluminum substrate with an intermediate metallic coating comprising between about 0.01% and about 99.99% nickel and between about 99.99% and about 0.01% tin and having a thickness between about 0.005 mil and about 3 mils;

plating a metal selected from the group consisting of copper and nickel onto the intermediate metallic coating; and

heating the coated and plated aluminum substrate to form an alloy between said aluminum substrate and said intermediate metallic coating and to form an alloy between said intermediate metallic coating and the plated metal.

4,092,449

ALTERATION-SENSITIVE IMPRINTED ARTICLE

Donald J. Bernstein, 2 Grover Ter., Fairlawn, N.J. 07410

Continuation of Ser. No. 512,863, Oct. 7, 1974, abandoned, which is a continuation-in-part of Ser. No. 471,226, May 20, 1974, abandoned. This application Apr. 16, 1976, Ser. No. 677,809
Int. Cl.[2] B41M *3/14*; B44F *1/10, 1/12*
U.S. Cl. 428—29 **3 Claims**

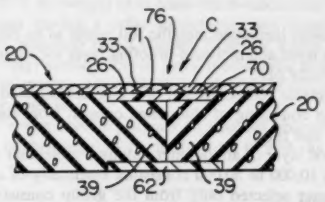
1. An alteration-sensitive imprinted article comprising a durable sheet of flexible plastic material having two opposing surfaces, at least one such surface being capable of retaining an ink coating; a positive design directly applied to at least a designated area of said one surface of said sheet; at least a translucent, non-erasable film or coating or sheet composed of plastic material bonded to and applied over at least said designated area of said one surface, said film or coating or sheet having on the side thereof opposed to that bonded to said one surface a negative design being exactly matched to said positive design so that negative and positive designs comprise a blanket or continuous covering over said designated area of said one surface; an erasable ink coating over said translucent, non-erasable film or coating or sheet covering over at least said designated area of said one surface; recorded information applied over said said erasable ink coating, and said blanket covering having a generally contrasting appearance to said erasable coating; so that an attempt to erase the recorded information will simultaneously cause an erasure of said erasable coating thereby revealing the covering formed by said negative and positive designs and its contrasting appearance.

4,092,450

CARPET SEAMING STRIP, METHOD OF MAKING SUCH STRIP, AND CARPET EMPLOYING SAME

Doyle V. Haren, Clyde, N.C., assignor to Dayco Corporation, Dayton, Ohio

Filed Jul. 13, 1977, Ser. No. 815,614
Int. Cl.[2] B32B *3/00*
U.S. Cl. 428—40 **20 Claims**



17. A carpet comprised of at least a pair of carpeting strips having a substantially invisible seam between said pair of carpeting strips; each carpeting strip comprising a wear layer having a bottom surface and opposed side edges, an adhesive coating disposed against said bottom surface along at least one of said side edges, said coating having an outer portion and an inner portion, a release tape disposed against said outer portion and having an edge disposed in alignment with said side edge, and a compressible backing material bonded against said bottom surface and against said inner portion of said adhesive coating while being isolated from said wear layer from said

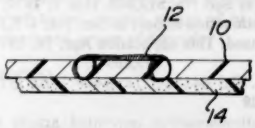
tape; said carpeting strips being disposed with said one side edges thereof in abutting relation with said tapes removed and with said outer portions of said adhesive coating bonded against a support bridging said side edges.

4,092,451

EMBROIDERY TRANSFER

Howard Sernaker, 610 Argyle Cir., Wynnewood, Pa. 19096, assignor to Howard Sernaker, Wynnewood, Pa.

Filed Mar. 8, 1976, Ser. No. 664,605
Int. Cl.[2] D05C *17/00*
U.S. Cl. 428—102 **8 Claims**



1. An embroidery transfer comprising a woven substrate of sheer diaphanous polymeric thermoplastic fabric, a machine embroidered pattern on one surface of said substrate but occupying less than the entire surface of said substrate so as to leave an exposed portion of the substrate, a layer of adhesive on the opposite surface of said substrate and the threads of said pattern exposed on said opposite surface of said substrate, said adhesive being a layer of polymeric thermoplastic material having a melting point less than the melting point of said substrate.

4,092,452

PLASTIC LAMINATED METALLIC FOIL AND METHOD FOR PREPARING THE SAME

Yutaka Hori; Zenzo Honda; Kenji Suzuki; Keiji Nakamoto, and Yoshiharu Yamamoto, all of Toyohashi, Japan, assignors to Nitto Electric Industrial Co., Ltd., Ibaraki, Japan

Continuation of Ser. No. 93,784, Nov. 30, 1970, abandoned. This application Mar. 3, 1975, Ser. No. 554,831
Claims priority, application Japan, Nov. 28, 1969, 44-95974; Jan. 30, 1970, 45-8637; Jan. 30, 1970, 45-8638
Int. Cl.[2] B32B *7/02, 15/08;* H01B *7/18*
U.S. Cl. 428—215 **27 Claims**

1. A plastic laminated metallic foil useful as an electrostatic shiledling layer and moisture-proofing layer for cables consisting essentially of:

(a) a metallic foil composed of a member selected from the group consisting of aluminum, copper, iron, steel, silver, gold and tin;

(b) a first layer of an ionomer having a molecular weight of from 10,000 to 50,000 consisting essentially of a base copolymer selected only from the group consisting of (1) ethylene-unsaturated carboxylic acid copolymers containing from 50 to 98 weight % ethylene and from 50 to 2% acid, and (2) ethylene-unsaturated carboxylic acid-unsaturated carboxylic acid ester ternary copolymers containing from 50 to 98 weight % ethylene and from 50 to 2 weight % of the acid and ester wherein no more than 20 weight %, based upon the weight of ethylene, of the ester is present in said ternary copolymer; and

(c) a second layer of a polymer having a molecular weight of from 10,000 to 50,000 consisting essentially of a member selected only from the group consisting of ethylene-vinyl acetate copolymers containing no more than 30 weight % vinyl acetate, and ethylene-unsaturated carboxylic acid ester copolymers containing no more than 95 weight % of the ester;

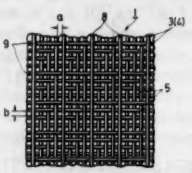
said first layer being laminated onto and bonded to at least one surface of said metallic foil and said second layer being further laminated onto and bonded to the outer surface of the laminated first layer, said second layer being characterized by adhesivity toward said first layer and toward polyolefin of the type used for jacketing conductive cables, the total thickness of the first and second layers ranging from 45 to 75 microns, and the thickness of said second layer ranging from 20 to 30 microns.

4,092,453

LIGHTWEIGHT STRUCTURAL PART FORMED OF CARBON FIBER-REINFORCED PLASTIC

Wolfgang Jonda, Oberpframmern, Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Filed Dec. 11, 1975, Ser. No. 639,927
Claims priority, application Germany, Dec. 21, 1974, 2460807
Int. Cl.[2] B32B *7/00*
U.S. Cl. 428—255 **11 Claims**



1. A lightweight structural part comprising carbon fiber rovings impregnated with synthetic resin, said rovings wound into a laminated structure with the laminated wound structure subsequently being molded, wherein the improvement comprises that said laminated structure comprises a plurality of band-shaped fiber strands each containing a plurality of carbon fiber rovings and wound into a lattice-type structure, each said fiber strand comprising a plurality of rovings, said lattice-type structure including a first group of fiber strands and a second group of fiber strands with the fiber strands of each of said first and second groups being disposed in spaced relationship and said first group of fiber strands extending transversely of said second group of fiber strands with said fiber strands of said first and second groups forming a woven-type repetitive pattern of limited area.

4,092,454

NOVEL NONWOVEN FABRIC AND METHOD FOR MANUFACTURING SAME

Masahiro Domoto, Toyonaka, and Kozo Tsuji, Takatsuki, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka and Hayashibara Biochemical Laboratories, Inc., Okayama, both of, Japan

Filed May 27, 1976, Ser. No. 690,655
Claims priority, application Japan, May 29, 1975, 50-64878
Int. Cl.[2] D04H *1/58*
U.S. Cl. 428—288 **3 Claims**

1. A nonwoven fabric comprising fibers of a material selected from the group consisting of rayon, cotton, pulp, Tetoron, nylon, acetate, vinylon, and polyvinyl chloride and, as a binder, pullulan having a molecular weight of 10,000 to 5,000,000, its enzymated, etherified, cationized, aminated, carboxymethylated or carboxylated derivatives, or mixture thereof, said binder being used in an amount of 5 to 150% of dry pick up.

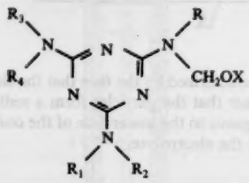
4,092,455

USE OF METHYLENEBIS- AND THIOBISNAPHTHOLS AS PROMOTERS IN TIRE CORD ADHESION TO RUBBER

Frank George Pinto, Martinsville, and Earl Kaplan, Metuchen, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 8, 1976, Ser. No. 664,468
Int. Cl.[2] C08K *3/04, 3/36, 5/34*
U.S. Cl. 428—295 14 Claims

1. In a vulcanizable rubber composition comprising rubber, a filler material and an N-(substituted oxymethyl) melamine having the general formula:



wherein X is hydrogen or lower (C_1–C_8) alkyl; R, R_1, R_2, R_3 and R_4 are individually hydrogen, lower (C_1–C_8) alkyl or the group — CH_2OX, X being as defined hereinabove, the improvement which comprises: incorporating into said rubber composition an effective adhesion promoting amount of a compound selected from (a) 1,1′-methylenebis(2-naphthol), (b) 2,2′-methylenebis (1-naphthol), (c) mixtures of (a) and (b), (d) 1,1′-thiobis(2-naphthol), (e) 2,2′-thiobis(1-naphthol), (f) mixtures of (d) and (e), (g) 4,4′-methylenebis(1-naphthol) and (h) 4,4′-thiobis(1-naphthol).

12. A vulcanized rubber article reinforced with a textile fiber or wire cord prepared from the vulcanizable rubber composition of claim 1.

4,092,456

TRANSFER ELEMENTS AND PROCESS

Douglas A. Newman, and Allan T. Schlotzhauer, both of Glen Cove, N.Y., assignors to Columbia Ribbon & Carbon Mfg. Co., Inc., Glen Cove, N.Y.

Continuation-in-part of Ser. No. 360,334, May 14, 1973, Pat. No. 4,042,744, and a continuation-in-part of Ser. No. 213,534, Dec. 29, 1971, abandoned. This application Jan. 10, 1975, Ser. No. 540,086
Int. Cl.[2] B41C *1/06*
U.S. Cl. 428—307 10 Claims

1. Process for producing a liquid ink-releasing transfer element comprising the steps of:

(a) preparing a composition consisting essentially of a synthetic film-forming binder material, a volatile solvent for said binder material, a particulate heat-activatable solid blowing agent and a particulate solid which is soluble in a volatile solvent which is a non-solvent for said binder material, said blowing agent and particulate solid being insoluble in said solvent for said binder material and said particulate solid being present in a larger amount by weight than said blowing agent;

(b) depositing said composition and evaporating said volatile solvent to form a solidified mass of said binder material containing said blowing agent and said particulate solid;

(c) heating said solidified mass to activate said blowing agent and liberate a gas to form gas-containing pores within said mass, some of said liberated gas being permitted to escape from said layer due to the presence of said particulate solid which provides weak adhesion interfaces between itself and said binder material, thereby avoiding excessive puffing and weakening of the resinous structure;

(d) washing said porous mass with a volatile liquid which is a solvent for said particulate solid but is a non-solvent for said binder material, to dissolve said particulate solid from said porous mass to increase the porosity thereof, the partial porosity of said porous mass, caused by activation of the said blowing agent, permitting said volatile liquid to penetrate within said porous mass to facilitate dissolution and removal of said particulate solid;

(e) evaporating said volatile liquid to form a dry microporous solidified mass; and

(f) impregnating said microporous solidified mass with a liquid, non-drying ink to produce a transfer element capable of exuding said liquid ink under the effects of applied pressure.

4,092,457

METHOD FOR THE PRODUCTION OF A SYNTHETIC FIBER PAPER HAVING AN IMPROVED PRINTABILITY FOR OFFSET PRINTING AND THE PRODUCT THEREOF

Seigoro Fujita, and Tojiro Kitahori, both of Amagasaki, Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 452,841, Mar. 20, 1974, abandoned. This application Feb. 18, 1976, Ser. No. 658,925
Claims priority, application Japan, Mar. 24, 1973, 48-33696
Int. Cl.[2] B32B *27/32, 27/00*
U.S. Cl. 428—341 20 Claims

1. A method for the production of a synthetic fiber paper having improved printability for offset printing which comprises coating a sheet material formed of a fibrous material wherein

a. the fibrous material is prepared from materials selected from the group consisting of polyolefin fibers containing a hydrophilic component therein and a mixture of polyolefin fibers containing a hydrophilic component therein and natural cellulose fibers, and

b. the coating being applied to the fibrous material in an amount of at least 0.3 g/m^2 on a dry basis and being an aqueous composition consisting essentially of a water soluble polymer and an aqueous polymer emulsion, said emulsion being an aqueous emulsion of a copolymer prepared by the emulsion or suspension polymerization of

i. 30 to 80% by weight of an aliphatic hydrocarbon monomer selected from the group consisting of ethylene, propylene and butadiene; and

ii. 70 to 20% by weight of at least one α-substituted olefinic monomer having a polar substituent, said α-substituted olefinic monomer being selected from the group consisting of vinyl acetate, acrylic ester, methacrylic ester, acrylonitrile, styrene, vinyl chloride, vinylidene chloride and chloroprene, and

the ratio of water soluble polymer to aqueous polymer emulsion being in the range of from 90:10 to 10:90% by weight solids.

4,092,458

POROUS LAMINAR PELLETS OF WASTE POLY(ETHYLENE TEREPHTHALATE) FILM, AND PROCESSES FOR DRYING AND POLYMERIZATION

Frank Edward Hoffman, Circleville, Ohio, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 577,848, May 15, 1975, abandoned. This application Apr. 12, 1976, Ser. No. 676,141
Int. Cl.[2] B32B *5/16;* C08J *11/04*
U.S. Cl. 428—402 5 Claims

1. A pellet consisting of a plurality of flakes of a crystalline ethylene terephthalate polymer, the flakes being crenulated

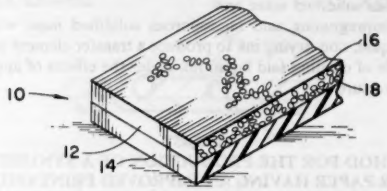
and in laminar configuration with adjacent flakes being mechanically interlocked at flake edges.

4,092,459

POWDER PRODUCTS

Robert J. Deffeyes, and Grover Lee Johnson, both of Arlington, Tex., assignors to Graham Magnetics Incorporated, Graham, Tex.

Filed Jan. 13, 1975, Ser. No. 540,521
Int. Cl.² B32B *15/02*; B22F *1/02*
U.S. Cl. 428—403 **26 Claims**



1. A mass of small particles formed of an electroconductive metal core material and comprising, adherent to said core material, a thin coating of an electrically conductive, corrosion resistant, surface layer of electrically conductive carbides, said mass having an electrical resistivity below 2500 ohm cm.

4,092,460

COMPOSITIONS INTENDED FOR THE FLAMEPROOFING OF PLASTICS

Jacqueline Cerny, and Gilbert Vivant, both of Lyon, France, assignors to Rhone-Poulenc Industries, Paris, France

Filed May 28, 1976, Ser. No. 690,844
Claims priority, application France, Jun. 10, 1975, 75 18039
Int. Cl.² C08K *3/02*; C08L *1/10*
U.S. Cl. 428—407 **12 Claims**

1. Compositions intended for flameproofing plastics, which compositions do not evolve toxic products when use is made of the plastics, characterized in that said compositions consist of a pulverulent mixture comprising:

(a) 50 to 95% by weight of red phosphorous in particulate form, having a mean particle size of less than 200 μ, and

(b) 5 to 50% by weight of at least one polymer or prepolymer which contains malenoid, fumaroid or allyl unsaturated bonds and in which the particles of red phosphorous are coated with the polymer or prepolymer.

6. A flameproofed plastic comprising a plastic and 0.2 to 20% by weight relative to the plastic of a flame proofing agent which does not evolve toxic products when use is made of the plastic comprising 50 to 95% by weight of red phosphorous in particulate form and 5 to 50% by weight of a polymer or prepolymer which contains malenoid, fumaroid, or allyl unsaturated bonds.

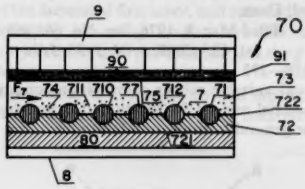
4,092,461

ELECTROCHEMICAL GENERATORS WITH A SEDIMENTATION BED

Pierre Durand, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Aug. 4, 1977, Ser. No. 821,760
Claims priority, application France, Aug. 6, 1976, 76 24465
Int. Cl.² H01M *8/04*
U.S. Cl. 429—15 **31 Claims**

1. A process for the production of electric current utilizing electrochemical reactions in a generator comprising at least one cell having at least one compartment containing a liquid electrolyte and having a lower face formed at least in part by all or part of the surface of at least one electron collector arranged on the electrolyte side, the said process consisting in creating a flow through the compartment of the electrolyte containing solid particles which are at least partially active and/ or solid particles transporting at least one active material, the density of the particles being greater than the density of the



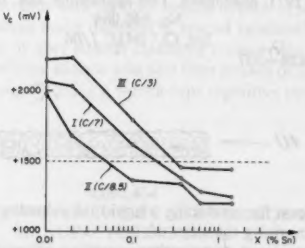
electrolyte, characterized by the face that the flow takes place in such a manner that the particles form a sedimentation bed which is contiguous to the lower face of the compartment and is entrained by the electrolyte.

4,092,462

ELECTRODE GRIDS FOR LEAD ACCUMULATORS

Herbert Giess, Geneva, Switzerland; Brian Burrows, Mississauga, Canada, and Marie-Michelle Janssoone, Annecy, France, assignors to Battelle Memorial Institute, Geneva, Switzerland

Filed Apr. 11, 1977, Ser. No. 786,259
Claims priority, application Switzerland, Apr. 13, 1977, 4653/77
Int. Cl.² H01M *10/44*
U.S. Cl. 429—50 **5 Claims**



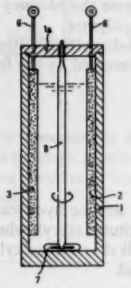
1. In an electrode grid for a lead accumulator, the grid comprising a lead alloy which is substantially free from antimony, said alloy containing the elements tellurium, arsenic and silver in a total concentration of at most 0.1% by weight, the improvement comprising said alloy containing at least 0.1% by weight of tin, the balance of said alloy being pure lead.

5. A method of suppressing polarization of a lead alloy electrode grid in a lead accumulator, said lead alloy electrode grid having a total concentration of tellurium, arsenic and silver no more than 0.1 weight percent and being substantially free of antimony, polarization of said grid being suppressed by including more than 0.1 percent by weight tin in said alloy the balance of said alloy being pure lead.

4,092,463
SECONDARY BATTERY

Rolf Wurmb, Heidelberg; Fritz Beck, and Klaus Boehlke, both of Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Jul. 9, 1976, Ser. No. 703,957
Claims priority, application Germany, Jul. 21, 1975, 2532512
Int. Cl.² H01M *10/38*
U.S. Cl. 429—105 8 Claims



1. A secondary battery having inert electrode base plates and employing as electrolyte an aqueous acid solution of a lead salt containing, dissolved therein, a redox system which has a standard potential of from −0.1 to +1.4 V relative to a standard hydrogen reference electrode and which does not form insoluble compounds with the remaining electrolyte constituents and is not oxidized or reduced irreversibly by active materials on the electrode base plate in the range of the operating potential of the redox system.

4,092,464
FLEXIBLE CELLS AND BATTERIES FORMED THEREFROM

Arabinda N. Dey, Needham, and Per Bro, Andover, both of Mass., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Jul. 19, 1976, Ser. No. 706,877
Int. Cl.² H01M *4/02, 6/16*
U.S. Cl. 429—127 19 Claims

1. A cathodic structure for a flexible electrochemical cell comprising a compressed mixture of a powdered cathode active material, chopped graphite fibers, and a binder; said mixture being affixed to a flexible metallic current collector; a metal tab affixed to said collector; and said compressed mixture and said current collector being sealed within a plastic pouch with said metallic tab extending therethrough; the plastic of said plastic pouch having sufficient porosity to permit ionic flow therethrough, and the pores thereof being sufficiently small that solid particles will not pass therethrough.

9. A flexible, non-gassing, high energy density electrochemical cell comprising a flexible, active metal anode having an electrically conductive tab operatively associated therewith; an organic electrolyte; a cathodic structure as defined in claim 1; and an outer, flexible, electrolyte impermeable container hermetically sealed around said anode, said electrolyte and said cathodic structure, with said tabs extending through said outer container.

4,092,465
ADHESIVE FORMULATIONS INCORPORATING HYDROXYL-CONTAINING POLYMERS AND ALKYL SILICATES, BORATES OR CARBONATES

Carl A. Uraneck; John E. Burleigh, and Oren L. Marrs, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 3, 1976, Ser. No. 747,143
Int. Cl.² C08K *5/54, 5/55*
U.S. Cl. 526—1 7 Claims

1. A pressure-sensitive adhesive comprising:
(1) a rubbery polymer having an alkadienol constituent and
(2) an adhesion promoter conforming to the formula $(R''Z)_nY$ wherein Y is Si, B or CO; wherein Z is O, S, NH or NR'' with the proviso that Z can be NH or NR'' only when Y is Si; wherein *n* is 2 if Y is CO, 3 if Y is B and 4 if Y is Si; and wherein the R'' groups are the same or different and are chosen from alkyl or cycloalkyl groups containing from 1 to about 18 carbon atoms per group.

4,092,466
HEAT RESISTANT POLYMERS OF OXIDIZED STYRYLPHOSPHINE

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of and Kazimiera Jola Liliana Paciorek, Corona Del Mar, Calif.

Filed Jul. 19, 1976, Ser. No. 706,424
Int. Cl.² C08F *26/00*; C08C *19/22, 19/24*; C08F *30/02*
U.S. Cl. 526—13 7 Claims

1. A process for treating homopolymers, copolymers and terpolymers of styrene based monomers, which comprises:
polymerizing or copolymerizing p-diphenylphosphinestyrene by bulk or solvent polymerization procedures; and
oxidizing said polymerized p-diphenylphosphinestyrene with at least one organoazide selected from the group consisting of $(C_6H_5)_2P(O)N_3$, $(C_6H_5O)_2P(O)N_3$, $(C_6H_5)C_3N_3(N_3)_2$ and $(C_6H_5)_2C_3N_3(N_3)$.

4,092,467
CONTROLLED POLYMERIZATION OF DIMETHYLDIALLYLAMMONIUM HALIDES BY THE USE OF ALKALI METAL OR AMMONIUM BISULFITES OR METABISULFITES

Richard P. Welcher, Old Greenwich; Robert Rabinowitz, and Algird S. Cibulskas, both of Stamford, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Feb. 9, 1977, Ser. No. 767,091
Int. Cl.² C08F *2/10, 4/40*
U.S. Cl. 526—80 9 Claims

1. A process for preparing polymers of dimethyldiallyl ammonium halide while maintaining low unreacted monomer content therein which comprises preparing an aqueous solution containing from about 40 to 70 weight percent of said monomer, effecting polymerization at elevated temperature by incremental addition of an effective amount of a compatible free radical catalyst, and controlling said polymerization to provide a polymer having an intrinsic viscosity in the range of about 0.1 to 1.45 deciliters per gram by the incremental addition of from about 0.01 to 10.0 weight percent of an alkali metal or ammonium bisulfite or the corresponding metabisulfite based on the weight of monomer at a fixed level of said free radical catalyst, during the course of said polymerization.

4,092,468

MANUFACTURE OF OLEFIN POLYMERS

Wolfgang Gruber, Frankenthal; Hans Frielingsdorf, Bad Durkheim, and Heinz Mueller-Tamm, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhein, Germany

Filed Jan. 21, 1977, Ser. No. 761,259

Claims priority, application Germany, Feb. 6, 1976, 2604549

Int. Cl.[2] C08F 4/02, 4/24, 4/78, 10/00

U.S. Cl. 526—105 8 Claims

1. A process for the manufacture of an olefin polymer by polymerizing one or more α-monoolefins of 2 to 8 carbon atoms at from 60° to 160° C, and an olefin pressure of from 0.5 to 40 bars, by means of a catalyst obtained from a silicon-containing material (component a), an organo-metallic compound containing alkyl groups (component b) and a chromium compound (component c), wherein the catalyst employed is obtained by

(1) first bringing into contact

(1.1) an alkogel (component a) of the empirical formula

$$SiO_2 \cdot m\ Al_2O_3 \cdot n\ ROH$$

where m is a number from 0 to 2, n is a number such that the content of ROH in the alkogel is from 1 to 85 percent by weight and R is alkyl of 3 to 8 catbon atoms, said alkogel having been prepared from a silicic acid hydrogel containing from 10 to 25 percent by weight of solids, calculated as silicon dioxide, by replacing the water in the hydrogel by an alcohol of the formula ROH defined above, and

(1.2) an aluminum compound containing alkyl groups (component b) of the general formula

$$R'_pAl(OR'')_{3-p}$$

where R′ is alkyl of 1 to 8 carbon atoms, R″ is open-chain alkyl of 1 to 8 carbon atoms or cyclic alkyl of 5 to 8 carbon atoms and p is a number from 1 to 3, with intimate mixing, to form a solid-phase reaction product,

(2) then bringing into contact

(2.1) the solid-phase reaction product obtained from stage (1) and

(2.2) a solution of a chromium compound (component c), which compound is chromium trioxide or a chromium compound which is converted to chromium trioxide under the conditions of stage (3), with intimate mixing and evaporation of the solvent, and (3) finally keeping the product obtained from stage (2) in an anhydrous stream of gas, containing oxygen at a concentration of more than 10 percent by volume, for from 10 to 400 minutes, at from 600° to 1,000° C, with the proviso that (I) the catlyst contains from 0.1 to 10 parts by weight of component b (calculated as aluminum) and from 0.3 to 10 parts by weight of component c (calculated as chromium trioxide) per 100 parts by weight of component a (calculated as silicon dioxide), and (II) that the product obtained from stage (1) or from stage (2) is dried and comminuted, before being used further in the next stage, until it no longer loses weight in the course of 30 minutes at 100° C under a pressure of 10 mm Hg and has attained a particle diameter of from 20 to 2,000 μm.

4,092,469

CLEAVABLE BRANCHING AGENTS IN EMULSION POLYMERIZATION SYSTEMS

Carl A. Uraneck, and Paul W. Solomon, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 635,002, Nov. 25, 1975, Pat. No. 4,041,227. This application Jan. 12, 1977, Ser. No. 758,724

Int. Cl.[2] C08F 4/34, 8/00

U.S. Cl. 526—184 30 Claims

1. A process of preparing a milled polymer which comprises milling a polymer prepared by the steps of polymerizing at least one polymerizable monomer selected from conjugated dienes and conjugated dienes with a vinyl comonomer, with a free radical generating initiator, employing emulsifier, molecular weight modifier, aqueous medium, and a minor effective amount of a bis(1,3-dienyl)dialkylmetal compound which is a bis(1,3-dienyl)dialkyltin, -germanium, or -lead compound, under aqueous emulsion polymerization conditions, wherein said minor effective amount of said tin, germanium, or lead compound is effective to result in a millcleavable polymer, and wherein said milling of said polymer is at a temperature and time effective to decrease the Mooney value thereof, thereby preparing said milled polymer,

wherein said bis(1,3-dienyl)dialkyltin, -germanium, or -lead compound is represented by the formula:

wherein each D is an acyclic hydrocarbyl conjugated dienyl radical, or a ring-substituted styryl, wherein each R is a hydrocarbyl radical and is alkyl or cycloalkyl, and wherein M is said tin, germanium, or lead.

4,092,470

STABLE, PUMPABLE, AQUEOUS SUSPENSIONS OF ORGANIC PEROXIDES

Hendrik Harm Jannes Oosterwijk, Diepenveen, and Reinder Torenbeek, Twello, both of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Division of Ser. No. 666,993, Mar. 15, 1976, Pat. No. 4,039,475. This application Feb. 28, 1977, Ser. No. 772,606

Claims priority, application Netherlands, Mar. 14, 1975, 7507051; Jul. 2, 1975, 7507859

Int. Cl.[2] C08F 2/00, 4/00, 14/06, 214/06

U.S. Cl. 526—227 1 Claim

1. In a process for aqueous suspension polymerization of vinyl halide alone or in combination with a compound containing a terminal $CH_2{=}CH{<}$ group copolymerizable with said vinyl halide, or an acrylate, the improvement comprising reacting said monomers in the presence of a pumpable, stable, aqueous suspension which comprises at least about 20 weight % of an organic peroxide which is solid at about 20° C, at least about 0.2 weight % of a nonionic emulsifier having a maximum HLB-value of 12.5 and an emulsifier selected from the group consisting of nonionic emulsifiers having a minimum HLB-value of 12.5, and anionic emulsifiers, said nonionic emulsifier of minimum HLB-value of 12.5 percent present in an amount of at least about 0.2 weight %, and said anionic emulsifier present in an amount of at least about 0.01 weight %.

4,092,471

METHOD FOR REMOVING UNREACTED MONOMERS FROM AQUEOUS DISPERSIONS OF POLYMERIZATE

Shigeru Arai, Yachiyo; Kenichi Ito, Ibaragi; Kinya Ogawa, Ibaragi; Kazuhiko Kurimoto, Ibaragi, and Yoshihiro Shirota, Ibaragi, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Oct. 8, 1975, Ser. No. 620,819

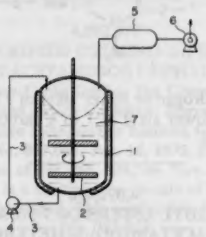
Claims priority, application Japan, Oct. 19, 1974, 49-120494

Int. Cl.[2] C08F 6/16, 6/10, 6/24

U.S. Cl. 528—502 4 Claims

1. In a method for the removal of unreacted monomeric material and any other volatile organic compounds from an aqueous dispersion of polymerizate produced by the polymerization of vinyl chloride or a mixture thereof with a copolymerizable monomer or monomers in an aqueous medium and contained in a container the improvement comprising the steps of circulating the aqueous dispersion after completion of polymerization from the bottom of the container to the upper part of the container by way of an exterior conduit, agitating the

aqueous dispersion during the step of circulating the dispersion, discharging the circulated dispersion, above the surface of the aqueous dispersion in said container and simultaneously



maintaining the aqueous dispersion at a temperature of from 60° C. to 90° C. under a pressure of between about 1.0 and 1.6 times the saturated vapor pressure of water at the temperature of the aqueous dispersion.

4,092,472

2,4-DICHLORO-5-(β-D-RIBOFURANOSYL) PYRIMIDINES AND SUBSTITUTED DERIVATIVES

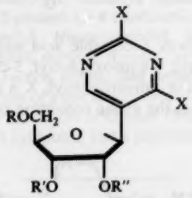
Leroy B. Townsend; Dean Sylvester Wise, and Robert Arthur Earl, all of Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah

Filed Jul. 30, 1976, Ser. No. 709,971

Int. Cl.² C07H *3/02*

U.S. Cl. 536—1 **9 Claims**

1. A compound, 2,4-dihalo-5-(2,3,5-Tri-O-acyl-β-D-ribofuranosyl)pyrimidine, having the structural formula



wherein R, R′ and R″ respectively are selected from a lower acyl organic group and X is selected from the group consisting of chlorine, bromine, iodine and fluorine.

4,092,473

TYLOSIN DERIVATIVES AND THEIR MANUFACTURING PROCESS

Rokuro Okamoto, Fujisawa; Tsumoru Fukumoto, Sagamihara; Akira Takamatsu, Yokohama, and Tomio Takeuchi, Tokyo, all of Japan, assignors to Sanraku Ocean Co., Ltd., Tokyo, Japan

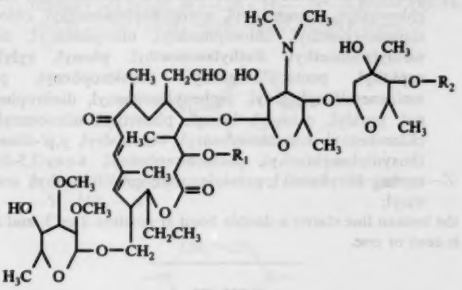
Filed Jul. 23, 1976, Ser. No. 708,151

Claims priority, application Japan, Aug. 1, 1975, 50-93053; Sep. 12, 1975, 50-110010; Dec. 27, 1975, 50-158388; May 15, 1976, 51-55626

Int. Cl.² A61K *31/71;* C07H *17/08*

U.S. Cl. 536—17 **9 Claims**

1. Acyl derivatives of tylosin having the formula I



wherein R_1 is H, acetyl or propionyl, R_2 is H, n-butyryl or isovaleryl, the case where both R_1 and R_2 are H being excluded; and the acid addition salts thereof selected from the group consisting of tartaric, acetic, propionic, citric, succinic, hydrochloric, sulfuric and phosphoric acid addition salts thereof.

4,092,474

CEPHALOSPORINS HAVING A METALOXY GROUP IN 3-SUBSTITUENT

Mitsuru Yoshioka, Toyonaka; Yuji Sendo, Ikeda, and Masayuki Murakami, Itami, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

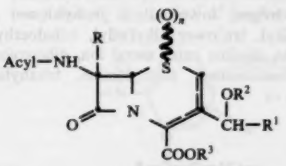
Filed Dec. 3, 1975, Ser. No. 637,477

Claims priority, application Japan, Dec. 6, 1974, 49-140775

Int. Cl.² C07D *501/16, 501/34, 501/28;* A61K *31/545*

U.S. Cl. 544—17 **11 Claims**

1. A compound of the formula:



wherein

Acyl is selected from a group of acyls consisting of formyl, acetyl, butyryl, pivaloyl, cyclopentylcarbonyl, cyclohexylcarbonyl, cyclohexylacetyl, cycloheptylacetyl, dihydrophenylacetyl, crotonyl, methoxyacetyl, methylthioacetyl, isopropenylthioacetyl, phenoxyacetyl, phenylthioacetyl, benzyloxyacetyl, benzoyl, xylol, naphthoyl, phthaloyl, tetrahydronaphthoyl, nicotinoyl, pyrazinoyl, 2-methyl-5-phenylisoxazol-5-ylcarbonyl, phenylacetyl, phenylpropionyl, tolylacetyl, naphthylacetyl, tetrahydronaphthylacetyl, tetrazolylacetyl, thienylacetyl, thienylpropionyl, furylacetyl, pyrimidylacetyl, pyrrylacetyl, isoxazolylacetyl, benzoisothiazolylacetyl, benzoxazolylacetyl, cyclohexyloxycarbonyl, cycloheptyloxycarbonyl, benzyloxycarbonyl, phenoxycarbonyl, naphthyloxycarbonyl, pyridylmethoxycarbonyl, 2,2,2-trichloroethoxycarbonyl and cyclopropylethoxycarbonyl;

R is hydrogen or methoxy;

R^1 is alkyl of 1 to 8 carbon atoms, cycloalkyl of up to 8 carbon atoms, phenylalkyl of up to 8 carbon atoms, or phenyl;

R^2 is lithium, sodium, potassium, magnesium, cadmium, zinc, chloromagnesium, bromomagnesium, iodomagnesium, bromozinc or bromocadmium;

R^3 is hydrogen, a pharmaceutically acceptable cation, or an ester residue selected from the group of methyl, ethyl, t-butyl, cyclohexyl, propenyl, methoxymethyl, ethoxymethyl, methylthioethyl, phenoxymethyl, phenylthi-

omethyl, tolylmethyl, chloromethyl, bromomethyl, trichloroethyl, cyanomethyl, nitrophenylthiomethyl, chlorophenoxymethyl, chlorophenacyl, nitrophenacyl, dimethylaminoethyl, diethylaminoethyl, phenyl, xylyl, naphthyl, pentachlorophenyl, trichlorophenyl, p-methanesulfonylphenyl, p-phenylazophenyl, dinitrophenyl, pyridyl, quinolyl, benzyl, phenethyl, nitrobenzyl, chlorobenzyl, trimethoxybenzyl, benzhydryl, p,p'-dimethoxydiphenylmethyl, pentachlorobenzyl, 4-oxy-3,5-ditertiary butylbenzyl, pyridylmethyl, quinolylmethyl, and vinyl;

the broken line shows a double bond at position 2 or 3; and *n* is zero or one.

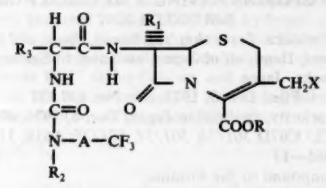
4,092,475

TRIFLUOROALKYLUREIDO 3-HETEROCYCLIC THIO METHYL CEPHALOSPORINS

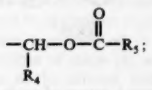
Hermann Breuer, and Uwe D. Treuner, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 9, 1976, Ser. No. 675,355
Int. Cl.[2] C07D *501/36*
U.S. Cl. 544—21 **20 Claims**

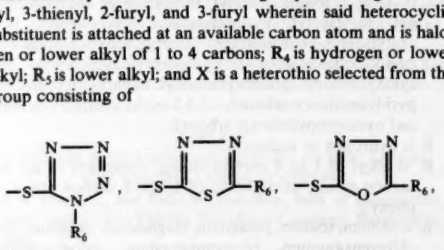
1. A compound of the formula



wherein R is hydrogen, lower alkyl, phenyl-lower alkyl, diphenyl-lower alkyl, tri(lower alkyl)silyl, trihaloethyl, an alkali metal ion, an alkaline earth metal ion, dibenzylamine, N,N-dibenzylethylenediamine, methylamine, triethylamine, N-ethylpiperidine, or



R_1 is in the α-configuration and is hydrogen or methoxy; R_2 is hydrogen or lower alkyl; A is straight or branched chain alkylene of 1 to 6 carbons; R_3 is phenyl, phenyl-lower alkyl, substituted phenyl or phenyl-lower alkyl wherein said phenyl substituent is one or two members selected from the group consisting of halogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, and hydroxy, or a mono substituted or unsubstituted heterocyclic selected from the group consisting of 2-thienyl, 3-thienyl, 2-furyl, and 3-furyl wherein said heterocyclic substituent is attached at an available carbon atom and is halogen or lower alkyl of 1 to 4 carbons; R_4 is hydrogen or lower alkyl; R_5 is lower alkyl; and X is a heterothio selected from the group consisting of



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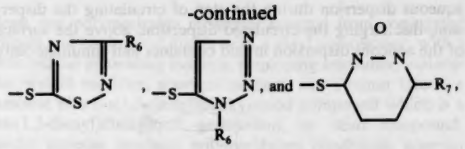


wherein R_6 is hydrogen or lower alkyl of 1 to 4 carbons and R_7 is hydrogen, lower alkyl of 1 to 4 carbons, methoxy, hydroxy, or halogen.

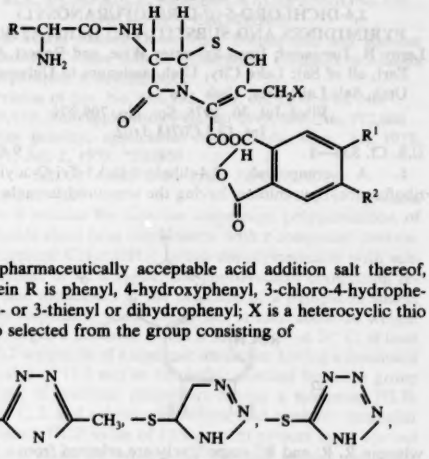
4,092,476

PHTHALIDYL ESTERS OF 7-[(α AMINO, 2 SUBSTITUTED ACETAMIDO)-3-(HETEROCYCLIC-THIO METHYL)]CEPHALOSPORINS

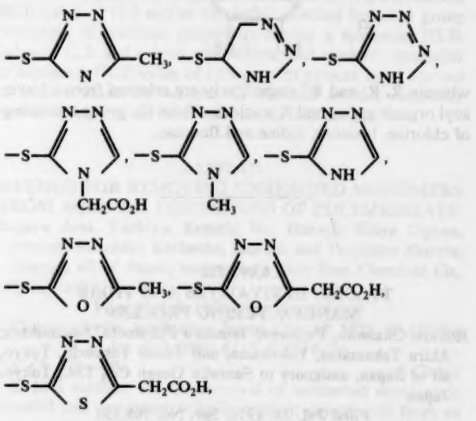
Peter Hubert Bentley, Rudgwick, and John Peter Clayton, Horsham, both of England, assignors to Beecham Group Limited, United Kingdom

Division of Ser. No. 549,374, Feb. 12, 1975, abandoned. This application Dec. 29, 1976, Ser. No. 755,240
Claims priority, application United Kingdom, Feb. 21, 1974, 7860/74
Int. Cl.[2] C07D *501/36*
U.S. Cl. 544—26 **6 Claims**

1. A cephalosporin ester of the formula



or a pharmaceutically acceptable acid addition salt thereof, wherein R is phenyl, 4-hydroxyphenyl, 3-chloro-4-hydrophenyl, 2- or 3-thienyl or dihydrophenyl; X is a heterocyclic thio group selected from the group consisting of



(2-methyl-1,3,4-thiadiazol-5-yl) thio, (1-methyl-(1H)-1,2,3,4-tetrazol-5-yl) thio and (1H-1,3,4-triazol-5yl) thio; and R^1 and R^2 are both hydrogen or methoxy.

6. A cephalosporin ester according to claim **1** in the form of an acid addition salt selected from the group consisting of the

sulphate, nitrate, phosphate, borate, hydrochloride, hydrobromide, hydroiodide, acetate, oxalate, tartrate, maleate, citrate, succinate, benzoate, ascorbate and methanesulphonate.

4,092,477

7β-[2-ETHERIFIED OXIMINO-2-(PHENYL- OR NAPHTHYLACETAMIDO)] CEPHALOSPORINS

Martin Christopher Cook; Gordon Ian Gregory, both of Chalfont St. Peter, and Janice Bradshaw, Harrow, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

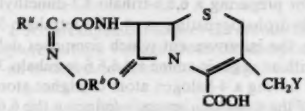
Division of Ser. No. 587,065, Jun. 16, 1975, Pat. No. 4,024,137, which is a division of Ser. No. 304,524, Nov. 7, 1972, Pat. No. 3,971,778, which is a continuation-in-part of Ser. No. 252,666, May 12, 1972, abandoned. This application Jan. 26, 1977, Ser. No. 762,943

Claims priority, application United Kingdom, May 14, 1971, 15082/71; Oct. 1, 1971, 45884/71; Oct. 25, 1972, 49255/72

Int. Cl.² C07D *544/36*

U.S. Cl. 544—26 **4 Claims**

1. A compound selected from the group consisting of a highly active cephalosporin antibiotic highly stable to β-lactamases, having the formula



wherein R^a is phenyl or naphthyl or each of these groups substituted by a chloro, bromo, iodo, fluoro, hydroxy, lower alkyl, nitro, amino, loweralkylamino, diloweralkylamino, lower alkanoyl, lower alkanoylamino, lower alkoxy, lower alkylthio or carbamoyl;

R^b is lower alkyl or cycloalkyl of 3–7 carbon atoms;

Y is a group of formula -SW where W is thiadiazolyl, 5-methyl-1,3,4-thiadiazol-2-yl, diazolyl, triazolyl, tetrazolyl, 1-methyltetrazol-5-yl, thiazolyl, thiatriazolyl, oxazolyl, oxadiazolyl, 2-phenyl-1,3,4-oxadiazol-5-yl, benzimidazolyl, benzoxazolyl, triazolopyridyl, benzothiazolyl, nitrobenzothiazolyl, purinyl, pyridyl, pyrimidyl or an alkyl group of 1-4 carbon atoms, said cephalosporin antibiotic being in the form of a syn isomer free of the corresponding anti isomer to the extent of at least 75% based on the total weight of said antibiotic; and a physiologically acceptable salt thereof.

4,092,478

TRIPHENDIOXAZINE TRIAZINYL DYES HAVING PHOSPHONIC ACID GROUPS

David William Plant, and David John Williams, both of Manchester, England, assignors to Imperial Chemical Industries Limited, United Kingdom

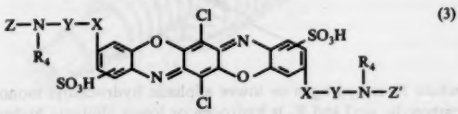
Filed Dec. 21, 1976, Ser. No. 752,918

Claims priority, application United Kingdom, Jan. 8, 1976, 672/76; Jan. 20, 1976, 2171/76; Mar. 24, 1976, 15397/75

Int. Cl.² C07D *491/22*

U.S. Cl. 544—76 **8 Claims**

1. A dyestuff having the formula:



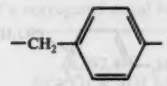
(3)

wherein

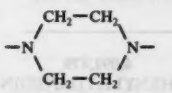
X is NH

R_4 is selected from the group consisting of H, C_{1-4} alkyl and C_{1-4} alkyl substituted by one of OH, SO_3H or COOH;

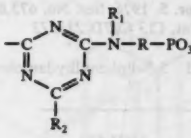
Y is selected from the group consisting of phenylene substituted by 0–2 SO_3H, or $—CH_2CH_2—$, or $—CH_2—CH(OH)—CH_2—$, or $—CH_2—CH_2—CH(OSO_3H)CH_2—$, or



or X and Y together are a direct link; or the group —X—Y—NR_4— is

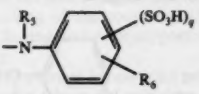


Z and Z' are each selected from the group consisting of H and



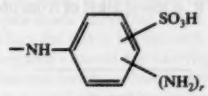
wherein

R_2 is OH; Cl; Br; NH_2; C_{1-4} alkylamino; di(C_{1-4}alkyl)amino; C_{1-4}alkyl amino or di(C_{1-4}alkyl) amino radicals of which one or both of the alkyl groups is substituted by OH, SO_3H, OSO_3H or COOH; N-morpholino; benzylamino; sulphobenzylamino; phenoxy; sulphophenoxy; mono-, di- or tri-sulphonaphthylamino; dicarboxy anilino; or a radical of the formula:



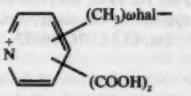
wherein

q = 0, 1 or 2; R_5 is H, methyl, sulphomethyl, ethyl or hydroxyethyl; and R_6 is H, CH_3, OCH_3, COOH, Cl, NH_2 or



where

r = 0 or 1 or R_2 is a quaternary ammonium group selected from the group consisting of $N^+(CH_3)_3$ hal^-, $N^+(CH_3)_2C_2H_5$ hal^- and



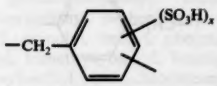
where

hal is Cl or Br, ω = 0 or 1 and z = 0 or 1;

R_1 is selected from the group consisting of H, C_{1-4} alkyl and C_{1-4} alkyl substituted by one of OH, SO_3H, or COOH, and

R is selected from the group consisting of C_{1-6} alkylene, C_{1-6} hydroxyalkylene, phenylene having 0–3 substituents each selected from the group consisting of SO_3H,

C_{1-4} alkyl, alkoxy and chloro; naphthylene, sulphonaphthylene, benzylidene and a group of the formula:



where

$x = 0$ or 1 providing that at least one of Z and Z^1 is not H.

4,092,479

LABELED 5,5-DIPHENYLHYDANTOIN DERIVATIVES FOR RADIOIMMUNOASSAY

George H. Parsons, Jr., Arlington, and Thomas Eller, Boston, both of Mass., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Apr. 5, 1976, Ser. No. 673,853

Int. Cl.[2] C07D *233/72*

U.S. Cl. 548—312 **1 Claim**

1. Radioiodinated 5,5-diphenylhydantoin-3-(5-valeryl-N-tyrosine).

4,092,480

INTERMEDIATES FOR PREPARING SUBSTITUTED PHENYLGLYCYLCEPHALOSPORINS

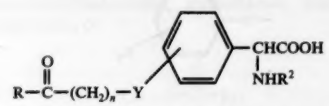
John Gerald Gleason, Cornwells Heights, Pa., assignor to Smith-Kline Corporation, Philadelphia, Pa.

Division of Ser. No. 641,064, Dec. 15, 1975, Pat. No. 4,044,047, which is a division of Ser. No. 384,771, Aug. 1, 1973, Pat. No. 3,953,439. This application Apr. 28, 1977, Ser. No. 791,810

Int. Cl.[2] C07C *101/20, 101/26;* A61K *31/54*

U.S. Cl. 560—37 **4 Claims**

1. A compound of the formula:



in which:

Y is O or NH;

n is 1 to 5;

R is OR′, where R′ is lower alkyl of from one to four carbon atoms; and

R^2 is hydrogen.

4,092,481

PROCESS FOR THE RECOVERY OF DIMETHYL TEREPHTHALATE AND OF INTERMEDIATES FROM THE DIMETHYL TEREPHTHALATE MANUFACTURE

Heinrich Bünger, Siegburg-Kaldauen, Germany, assignor to Dynamit Nobel Aktiengesellschaft, Germany

Filed Jun. 10, 1975, Ser. No. 585,760

Claims priority, application Germany, Jun. 10, 1974, 2427875

Int. Cl.[2] C07C *69/82*

U.S. Cl. 560—77 **16 Claims**

1. A process for the production of dimethyl terephthalate and intermediate products of the dimethyl terephthalate manufacture from the high-boiling by-products obtained during the combined air oxidation of p-xylene and methyl p-tolute in the liquid phase, subsequent esterification of the thus-formed acids, and separation of the thus-produced esters by distillation, characterized in that these by-products are first treated with methanol at temperatures between 180° C. and 350° C. and under pressures of between 0 and 60 atmospheres gauge in an amount sufficient for setting the necessary reaction pressure at the selected reaction temperature and are then separated by distillation with the addition of a carrier gas or a carrier vapor at temperatures of between 150° C. and 300° C. and under pressures of between 1 torr and 10 atmospheres gauge to thereby provide a high yield of dimethyl terephthalate and a high yield of the intermediate product of the dimethyl terephthalate manufacture.

4,092,482

PROCESS FOR PREPARING 6,6,6-TRIHALO-3,3-DIMETHYL-4-HEXENOATES

Kiyoshi Kondo; Kiyohide Matsui; Akira Negishi, all of Kanagawa, and Yuriko Takahatake, Tokyo, all of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

Filed Dec. 21, 1976, Ser. No. 753,077

Claims priority, application Japan, Dec. 26, 1975, 50-154755

Int. Cl.[2] C07C *69/65*

U.S. Cl. 560—213 **10 Claims**

1. In a process for preparing a 6,6,6-trihalo-3,3-dimethyl-4-hexenoate by dehydrohalogenating a 4,6,6,6-tetrahalo-3,3-dimethylhexanoate, the improvement which comprises dehydrohalogenating with an organic amine a 4,6,6,6-tetrahalo-3,3-dimethylhexanoate having a 4-halogen atom of higher atomic number than any of the 6-halogen atoms, producing the 6,6,6-trihalo-3,3-dimethyl-4-hexenoate.

4,092,483

INTERMEDIATES FOR STEROID TOTAL SYNTHESIS PROCESS UTILIZING ASYMMETRIC INDUCTION

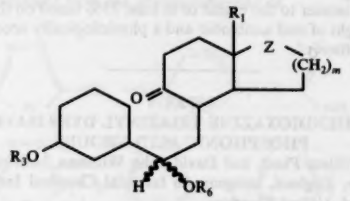
Noal Cohen, Montclair, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 406,980, Oct. 16, 1973, Pat. No. 3,932,519, which is a division of Ser. No. 100,372, Dec. 21, 1970, abandoned. This application Sep. 24, 1975, Ser. No. 616,222

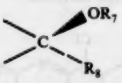
Int. Cl.[2] C07C *49/84, 69/16*

U.S. Cl. 560—255 **3 Claims**

1. A compound of the formula



where R_3 is a cycloalkyl group, or a primary alkyl group of from 1 to 8 carbon atoms; R_6 is hydrogen, lower aliphatic hydrocarbyl monocarboxylic acyl; R_1 is a primary alkyl group of from 1 to 5 carbon atoms; Z is a group of the formula



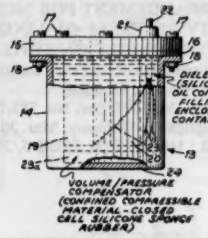
where R_7 is hydrogen or lower aliphatic hydrocarbyl monocarboxylic acyl and R_8 is hydrogen or lower aliphatic hydrocarbyl; and *m* is 1 or 2.

4,092,484

ARRANGEMENT TO PREVENT CORONA DISCHARGE AND ELECTRIC RUPTURE IN HIGH VOLTAGE ELECTRICAL COMPONENTS

Charles Peter Majkrzak, Nutley, and Vishno Edward Brennan, Glen Ridge, both of N.J., assignors to International Telephone & Telegraph Corporation, Nutley, N.J.

Filed Sep. 22, 1976, Ser. No. 725,208
Int. Cl.[2] H01F *27/02*
U.S. Cl. 174—12 R 10 Claims


DIELECTRIC (SILICONE) OIL COMPLETELY FILLING ENCLOSED CONTAINER
VOLUME/PRESSURE COMPENSATOR (CONFINED COMPRESSIBLE MATERIAL - CLOSED CELL SILICONE SPONGE RUBBER)

1. An arrangement to prevent corona discharge and electric rupture in high voltage electrical components comprising:

an enclosed container containing therein said electrical components;

a dielectric oil disposed in and completely filling said container; and

a volume/pressure compensator fastened to an inner surface of said enclosed container, said compensator including a confined compressible material compatible with said oil chemically, thermally and structurally;

said compensator being fastened to the bottom of said enclosed container;

said compensator including

a longitudinal freely-leaking container, and

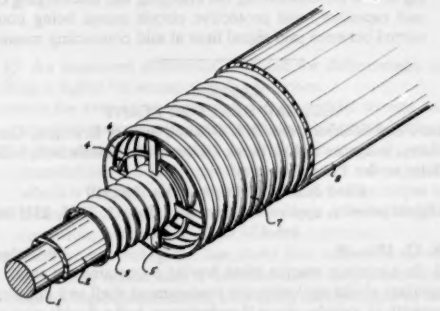
said compressible material is contained in said freely-leaking container.

4,092,485

GAS INSULATED ELECTRICAL HIGH OR VERY HIGH VOLTAGE CABLE

Gerhard A. H. Wanser, Langenhagen, Germany, assignor to Gould, Inc., Rolling Meadows, Ill.

Filed Nov. 2, 1976, Ser. No. 738,007
Claims priority, application Germany, Nov. 3, 1975, 2548974
Int. Cl.[2] H01B *1/02, 9/04*
U.S. Cl. 174—28 7 Claims



1. Gas insulated electrical high or ultrahigh voltage cable for transmitting high currents and including a current conducting, inner conductor and an outer tube spaced from the inner conductor in coaxial relation, the improvement comprising:

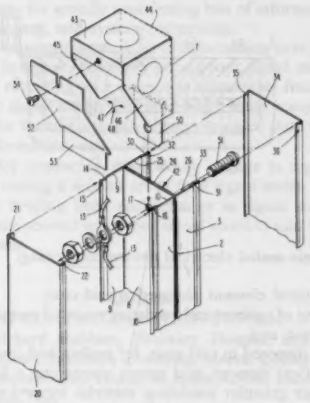
the inner conductor including a core of alkali-metal, an alloy thereof or two or more alkali-metals, being arranged within an adjoining protective cover made of thermoplastic or elastomeric material, said inner conductor further including a metal envelope enclosing the cover and being comprised of a corrugated metal tube.

4,092,486

SERVICE POLES

John L. Myers, Parkersburg, W. Va., assignor to Textron Inc., Providence, R.I.

Filed Sep. 13, 1976, Ser. No. 722,731
Int. Cl.[2] H02G *3/04*
U.S. Cl. 174—48 6 Claims



1. A service pole for supplying power and/or telephone outlets in a room, the pole being adapted to extend between the floor and the ceiling of the room and the ceiling being the suspended type having means for supporting ceiling panels, the pole comprising:

a first elongated channel for carrying power conductors, the channel having a base and two sides and the top of each side being off-set to form an interior groove and an exterior groove;

a first cover extending across the open space formed by the sides of the first channel, the opposite sides of the cover having contoured flanges fitting into said exterior grooves whereby the cover is removably connected to the sides and said open space providing access to the interior of the channel when the cover is removed;

a second elongated channel for carrying telephone conductors the channel having a base and two sides, the top of each side being off-set to form an interior groove and an exterior groove and the base of the second channel being riveted to the base of the first channel whereby to form a main support and each said channel being rolled of sheet material;

a second cover extending across the open space formed by the sides of the second channel, the opposite sides of the second cover having contoured flanges fitting into the exterior grooves of the sides of the second channel whereby the cover is removably connected to the sides, the open space providing access to the interior of the second channel when the second cover is removed and said channels and covers forming a pole housing;

a junction box disposed at the top of said pole housing in communication with said first channel, the junction box having a portion substantially off-set from the pole housing and carrying a removable cover facing in a downward direction; and

pedestal means disposed at the bottom of said pole housing for supporting the pole on a floor and said second cover

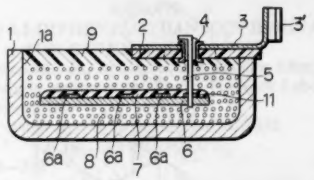
and said pedestal means being constructed and arranged to permit the second cover to be removed and provide access to the second channel without interference from the pedestal means.

4,092,487

RESIN-SEALED ELECTRICAL DEVICE

Takeshi Imai, Obu, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 6, 1976, Ser. No. 655,953
Claims priority, application Japan, Feb. 11, 1975, 50-17175
Int. Cl.[2] H05K *5/06*
U.S. Cl. 174—52 PE **12 Claims**



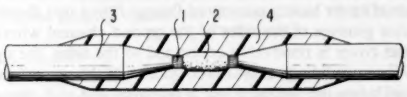
1. A resin-sealed electrical device comprising:
a case;
an electrical element disposed in said case;
a coating of resilient and insulating material on said electrical element; and
means, disposed in said case, for sealing and insulating said electrical element, said means comprising a first layer of minute granular insulating material located around said electrical element and said coating and a second layer of low viscous insulating resin formed on said first layer, the density of said minute granular insulating material being larger than that of said low viscous insulating resin so that said minute granular insulating material can impregnate into said low viscous insulating resin when said minute granular insulating material is charged onto said low viscous insulating resin, thereby to replace the positions of said minute granular insulating material and low viscous insulating resin to make said first and second layers, and further said first layer being composed of said minute granular insulating material and said low viscous insulating resin because of the impregnation of the former into the latter.

4,092,488

CONNECTION OR TERMINAL PORTIONS FOR CROSS-LINKED POLYETHYLENE CABLES

Toshiyuki Hayami; Hironaga Matsubara, and Shousuke Yamanouchi, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Oct. 24, 1975, Ser. No. 625,623
Int. Cl.[2] H02G *15/02;* D03D *13/00;* D02G *3/00*
U.S. Cl. 174—84 R **6 Claims**



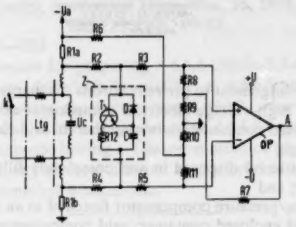
1. In the connection or terminal portions of cross-linked polyethylene-insulated cables produced by winding a tape around the connection or terminal portions of the cables and heatmolding the same, the improvement wherein said tapes comprise a blend of polyethylene and/or ethylene copolymer selected from the group consisting of ethylene-propylene copolymers, ethylene-methyl acrylate copolymers, ethylene-ethyl acrylate copolymers, ethylene-styrene copolymers and ethylene-acrylic acid copolymers plus an ethylene-vinyl acetate copolymer having a vinyl acetate of content of more than 15% present in an amount as to provide a vinyl acetate content of more than about 2.5% in said tape, which tape has been electron beam irradiated to a degree that the degree of gelation of said tape is about 20 to about 50%.

4,092,489

SWITCHING ARRANGEMENT FOR MONITORING POLARITY REVERSAL ON LINES IN TELECOMMUNICATION SYSTEMS

Josef Birlmeier, Deisenhofen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 30, 1977, Ser. No. 782,772
Claims priority, application Germany, Mar. 30, 1976, 2613590
Int. Cl.[2] H04L *15/00;* H03K *5/20*
U.S. Cl. 178—3 **3 Claims**



1. Apparatus for monitoring changes in polarity during signaling on signal lines in a telecommunications system, comprising:
differential amplifier means having a predetermined response threshold,
input circuit means connected to the input terminals of said differential amplifier,
connecting means having a higher valued impedance relative to said signal lines for connecting said input circuit means to said signal lines,
bias means for applying a bias voltage to said differential amplifier through said input circuit means,
feedback circuit means connecting an output of said differential amplifier to said input circuit means for coupling thereto an output voltage component having a polarity opposite to that of said bias voltage and
protective circuit means comprising a capacitor and switching means for controlling the charging and discharging of said capacitor, said protective circuit means being connected between said signal lines at said connecting means.

4,092,490

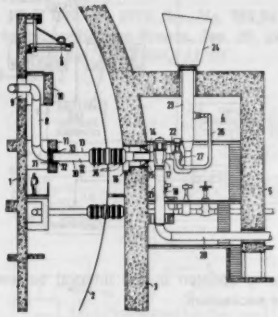
NUCLEAR REACTOR PLANT

Hans-Peter Schabert, and Rolf Drossel, both of Erlangen, Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim an der Ruhr, Germany

Filed Jun. 29, 1976, Ser. No. 700,910
Claims priority, application Germany, Jul. 11, 1975, 2531168
Int. Cl.[2] G21C *9/00*
U.S. Cl. 176—38 **10 Claims**

1. In a nuclear reactor plant having a containment shell, a secondary shield enclosing the containment shell and defining therewith an annular space therebetween, and a double pipe of a live steam or feedwater line passing through an opening formed in the containment shell and through the annular space into a passage formed in the secondary shield, the double pipe being formed of a pair of inner and outer pipe portions defining an annular space therebetween, and means for securely supporting said double pipe comprising a support member dis-

posed within the passage of the secondary shield for supporting an end of the double pipe therewithin, said support member having a substantially conical outer surface and being formed with an annular recess communicating with and terminating



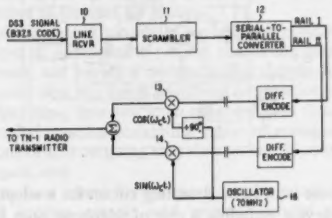
the annular space formed in the double pipe, and means for supporting the other end of the double pipe as it passes through the opening formed in the containment shell while affording longitudinal movement of said other end of the double pipe.

4,092,491

DIFFERENTIAL ENCODING AND DECODING SCHEME FOR DIGITAL TRANSMISSION SYSTEMS

Gerald Lee Frazer, Newton, N.H., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 4, 1977, Ser. No. 784,169
Int. Cl.² H04L *27/24*
U.S. Cl. 178—67 **32 Claims**



27. An improved differential encoder for differentially encoding a digital bit stream which comprises:

means for examining successive bits in said bit stream, said examining means generating an output bit which is identical to the previous output bit if the bit currently under examination is a first logical condition and an output bit which is the logical complement of the previous output bit if the bit currently under examination is a second logical condition, wherein the improvement comprises:

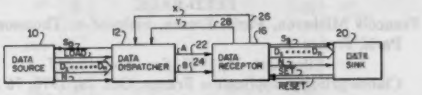
means for examining the last three bits output from said examining means and, if said last three output bits were not all logical equivalents, modifying the operation of said examining means such that said examining means generates an output bit which is the logical complement of the previous output bit if the bit currently under examination is said first logical condition and an output bit which is identical to the previous output bit if the bit currently under examination is a second logical condition.

4,092,492

CLOCKLESS SERIAL DATA TRANSFER

Joseph J. Eachus, Cambridge, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Nov. 24, 1976, Ser. No. 744,832
Int. Cl.² H04L *25/30*
U.S. Cl. 178—68 **30 Claims**



20. A system for serially transferring bits of information in a clockwise manner, said system comprising:

means for transmitting each bit of information as at least one change in signal state from among four signal states;

means for receiving each change in signal state from among the four signal states, said receiving means comprising:

means for translating each change in signal state into a bit of information, and

means for producing at least one change in signal state from among a second set of four signal states; and

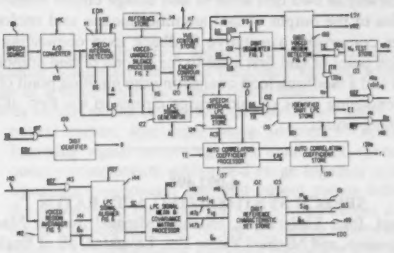
means for feeding back each change in signal state from among the second set of four signal states to said transmitting means.

4,092,493

SPEECH RECOGNITION SYSTEM

Lawrence Richard Rabiner, Berkeley Heights, and Marvin Robert Sambur, Randolph Township, Morris County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 30, 1976, Ser. No. 746,106
Int. Cl.² G10L *1/00*
U.S. Cl. 179—1 SD **15 Claims**



1. A speech recognizer comprising means responsive to repetitions of a continuous string of connected identified speech segments for partitioning said continuous string of connected identified speech segments into its identified speech segments, means for generating a set of reference signals corresponding to each identified speech segment representative of the mean values of prediction characteristics of the average of the voiced intervals of the repetitions of said identified speech segment, means responsive to a continuous string of connected speech segments including at least one unknown speech segment for partitioning said continuous string of connected speech segments into its speech segments, means for generating a set of test signals representative of the prediction characteristics of the voiced interval of said unknown speech segment, means for time aligning the test signals to the average voiced interval of each identified speech segment, means jointly responsive to said set of time aligned test signals and each set of reference signals for producing a signal representative of the correspondence between said time aligned voiced interval test signals and said voiced interval reference signals, and means

responsive to said correspondence signals for recognizing said unknown speech segment as one of said identified speech segments.

4,092,494

LOUD-SPEAKER ENCLOSURE WITH ELECTRICAL FEED-BACK

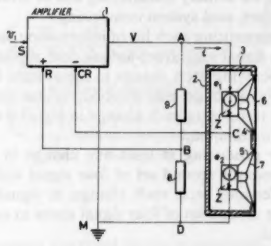
Francois Micheron, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Oct. 26, 1977, Ser. No. 845,717

Claims priority, application France, Oct. 29, 1976, 76 32716

Int. Cl.[2] H04R *1/22, 3/00, 3/02*

U.S. Cl. 179—1 F **12 Claims**



1. A loud-speaker enclosure with electrical feedback comprising a sealed box equipped with similar loud-speakers, amplifier means and a bridge circuit; said loud-speakers being excited by said amplifier means through the medium of said bridge circuit; said amplifier means having first and second branching points at which an incident signal produces output voltage components respectively in phase and in phase opposition; said loud-speakers being arranged into two groups having substantially equal emissive characteristics and being situated respectively in two first arms of said bridge circuit connected in series to the output of said amplifier means; said enclosure further comprising a negative feedback loop connecting the junction point of said first arms to the second of said branching points and a feedback loop connecting the junction point of the two remaining arms of said bridge circuit to the first of said branching points.

4,092,495

SPEECH SYNTHESIZING APPARATUS

Michael John Underwood, Hitchin; Michael Joseph Martin, Stevenage, and Michael Victor Iles, Loughton, all of England, assignors to International Computers Limited, London, England

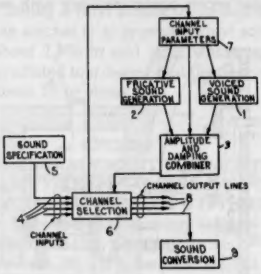
Filed Dec. 13, 1976, Ser. No. 749,748

Claims priority, application United Kingdom, Dec. 19, 1975, 52016/75

Int. Cl.[2] G10L *1/00*

U.S. Cl. 179—1 SM **6 Claims**

1. Speech synthesizing apparatus comprising means for generating a digital value representing an instantaneous amplitude of a voiced sound component during a sampling period; means for generating a digital value representing an instantaneous amplitude for each of a plurality of unvoiced sound components respectively in succession during a period greater than the duration of said sampling period; means for storing the values for the unvoiced sound components; means for registering parameters specifying characteristics of a sound to be reproduced; means responsive to the registering means for extracting from the store a selected one of the stored values; means for selectively combining, during the sampling period, voiced and unvoiced component values according to registered parameters; and timing means for synchronising the unvoiced sound generator with a succession of sampling periods to ensure that any one of the unvoiced sound values in said



storing means is updated in the interval between sampling periods of the succession.

4,092,496

VARIABLE IMPEDANCE DETECTING CIRCUIT FOR A TELEPHONE LINE AUXILIARY DEVICE

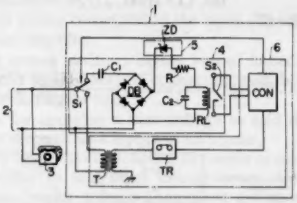
Shizuo Ando, and Hiroshi Mizuno, both of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 7, 1976, Ser. No. 730,564

Claims priority, application Japan, Oct. 9, 1975, 50-122272

Int. Cl.[2] H04M *1/64*

U.S. Cl. 179—6 R **6 Claims**



1. Variable impedance detecting circuit for a telephone line auxiliary device including a pair of telephone lines for transmitting relatively low frequency, high voltage call signals and relatively high frequency, low voltage sound signals and busy tone signals, comprising:

(a) voltage-controlled variable impedance means for presenting a low impedance to incoming call signals and a high impedance to incoming sound signals and busy tone signals,

(b) circuit means for producing an output signal in response to the presentation of a low impedance by said variable impedance means comprising a diode bridge rectifier having one input terminal connected to one of said telephone lines through a capacitor and a first switch and the other input terminal directly connected to the other of said telephone lines, a relay coil having one end directly connected to one output terminal of said bridge and the other end connected to the other output terminal of said bridge through said variable impedance means, and a second switch controiled by said relay coil, and

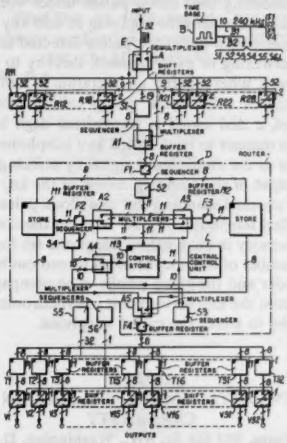
(c) auxiliary circuit means operable in response to said output signal.

4,092,497

CONNECTION NETWORK FOR PCM TDM AUTOMATIC TELEPHONE EXCHANGE EQUIPMENT

Gilbert Laneau, Paris, France, assignor to Jeumont-Schneider, Puteaux, France

Filed Dec. 28, 1976, Ser. No. 755,047
Claims priority, application France, Jan. 20, 1976, 76 01413
Int. Cl.[2] H04Q *11/04*
U.S. Cl. 179—15 AT 8 Claims



1. In a pulse code modulation (PCM) time division multiplex (TDM) automatic telephone exchange, a connection network for non-blanking transfer of a bit-group transmitted in a time slot from one of N incoming multiplex channels to a time slot in one of N outgoing multiplex channels comprising:

(a) first series-to-parallel converting means having N inputs, each input connected to one of said N incoming multiplex channels, and having M outputs, M corresponding to the number of bits in a bit-group,

(b) routing means having M inputs each connected to an output of said series-to-parallel converting means and M outputs, and having a storage facility therein, for simultaneously time and space switching information received in an incoming time slot to an outgoing time slot,

(c) parallel-to-series converting means receiving a bit-group of one of said outgoing time slots on said M routing means outputs, and

(d) time base means for synchornizing bit-group transfer in said routing means, said series-to-parallel converting means and said parallel-to-series converting means, and for producing a periodic resynchronizing pulse.

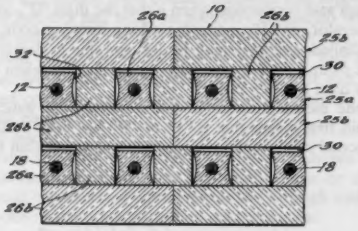
4,092,498

NEUTRONIC REACTOR

Warren R. Lewis, Richland, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 29, 1952, Ser. No. 307,002
Int. Cl.[2] G21C *5/02*
U.S. Cl. 176—84 3 Claims

1. A neutronic reactor comprising, in combination, a moderator comprising a plurality of rectangular blocks of extruded crystalline graphite, said blocks having longitudinal extrusion axes and being stacked in abutting relationship in layers, at least a portion of the layers of blocks being disposed with parallel longitudinal axes, a plurality of bodies of thermal neutron fissionable material disposed within a portion of the blocks in layers having blocks disposed with parallel longitudinal axes, said fissionable material containing blocks being provided with concave sides, said fissionable material containing blocks having smaller vertical dimensions than the other blocks in the same layer, thereby providing a space at the sides



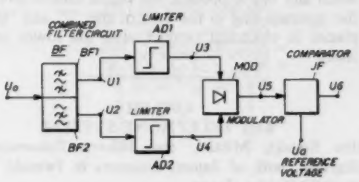
and the top between said fissionable material containing blocks and adjacent blocks.

4,092,499

APPARATUS FOR DETECTING A VOICE FREQUENCY SIGNAL

Bengt Gustav Lofmark, Skarholmen, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Sept. 10, 1976, Ser. No. 722,273
Claims priority, application Sweden, Oct. 3, 1975, 7511126
Int. Cl.[2] H04M *1/50*
U.S. Cl. 179—84 VF 4 Claims



1. Tone signal detecting apparatus for the detection of a signalling component having a frequency situated within the range of a voice frequency band comprising:

filter circuit means having an input and a first and a second output means, said input being adapted to receive an incoming signal consisting of a number of speech frequency components within said range together with said signalling component, said first output means delivering the signalling component and said second output delivering a suppressed value of the signalling component in relation to the values of the voice frequency components whereby a phase difference of certain value between the signals across said first and second output means is obtained dependent on the frequency deviation of said incoming signal relative to the frequency of said signalling component; signal limiting means for amplitude limiting the signals appearing across said first and second output means; and modulating means for product modulating the limited signals from said limiting means to produce a DC-component which forms an indication of the desired tone signal.

4,092,500

DEVICE FOR SELECTIVELY INTERRUPTING MECHANICAL OPERATION OF A MANUALLY OPERATED TELEPHONE

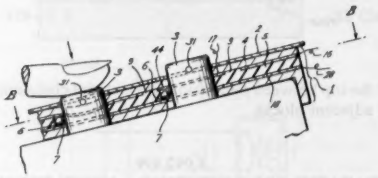
George W. Hughes, 2601 Mills, Houston, Tex. 77026

Filed Aug. 30, 1976, Ser. No. 718,896
Int. Cl.[2] H04M *1/66*
U.S. Cl. 179—90 D 2 Claims

1. In an attachment for a tone telephone having a manually actuable telephone number selector keyboard, a first means for

selectively interrupting a telephone connection, said first means comprising a bypass switch assembly operable in one position to complete said connection and in another position to interrupt said connection when either the digit "0", indicating the operator, or "1", indicating a long distance code, are initially dialled, and switching means operable to deactivate the bypass switch after the second digit is dialled when the first dialled digit is other than "0" or "1",

second means attached to said keyboard for indicating to said first means that a "1" or "0" has been dialled, said second means comprising upper and lower thin sheets of



flexible conductive material separated by a flexible insulating sheet including a passageway adjacent to each key, said upper sheet including circular openings around the "1" and "0" keys with conductive metal rings, which are separate and insulated from said upper sheet, surrounding said "1" and "0" keys and covering their associated passageways, contact means in each passageway such that, when any key is pressed, the upper conductive sheet, or the separate ring in the case of the "1" and "0" keys, is placed in electrical contact with the lower conductive sheet.

4,092,501

KEY TELEPHONE SYSTEM

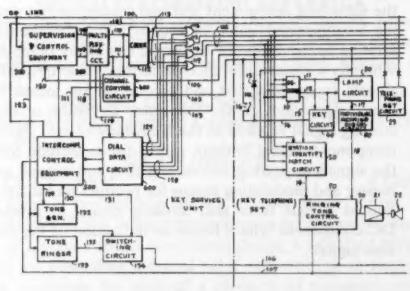
Akihiko Suzuki, Mitaka, and Hikaru Takematsu, Higashikurume, both of Japan, assignors to Iwasaki Tsushinki Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 529,046, Dec. 3, 1974, abandoned. This application Jan. 3, 1977, Ser. No. 756,546

Claims priority, application Japan, Dec. 5, 1973, 48-135278; Dec. 5, 1973, 48-135279; Dec. 5, 1973, 48-135280; Dec. 14, 1973, 48-138754

Int. Cl.² H04M *1/72*

U.S. Cl. 179—99 **3 Claims**



1. In a key telephone system including at least one CO trunk line, at least one intercomm. line, and control lines connected between a key service unit and a plurality of key telephone sets each having a read-only memory for storing the telephone number of the respective key telephone set, the improvement which comprises: said key service unit including scanning means for generating code unit signals indicating the connection state of each channel of said CO line and said intercomm. line in a time-division mode, and including means for transmitting code unit signals and clock pulses indicating the timing thereof as a multiplexed signal to each key telephone set through the control lines; and each of said key telephone sets including a decoder for decoding the code unit signals from the multiplexed signal to obtain individual indication signals indicating the states of each channel, and said key service unit including means for transmitting to each telephone set a control signal for separating the clock pulses from the code unit signals in the multiplexed signal; said decoder comprising means for detecting said clock pulses under control of said control signal, and means for applying to said key service unit a signal obtained from said clock pulses detected and indicating calling or answering of each channel, thereby to control said scanning means, wherein after an operation of individual intercomm. calling or intercomm. group calling from each key telephone set, a dial signal is transmitted digit by digit in a time-division manner to each called key telephone set through the same line as the multiplexed signal by utilizing at least one bit of the output of the scanning means of the ke, service unit not used for channel scanning and said clock pulses to select at least one called telephone set, and wherein the contents of the read-only memory in each called telephone set for storing the telephone number of the telephone set is read out by the output of said decoder and the clock pulses to be compared with the dial signal from the key service unit in synchronism with each other, thereby to select the called telephone.

4,092,502

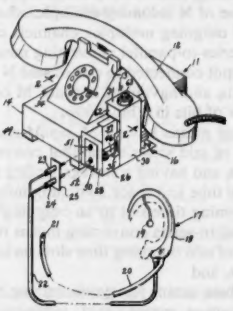
TELEPHONE ATTACHMENT FOR PLUG-IN HEADSET CAPABILITY

Ronald B. Jones, 901 6th St. SW., Washington, D.C. 20024

Filed Nov. 3, 1976, Ser. No. 738,365

Int. Cl.² H04M *1/02*

U.S. Cl. 179—100 R **9 Claims**



1. In combination with a telephone of the type having a handset provided with a transmitter and receiver and wiring terminals therefor, cradle means receiving said handset and a hook switch operated by the handset when so received and having wiring terminals in the telephone, adaptor means comprising a support including means clampingly engaged with the telephone, said clamping means comprising opposing upstanding flanges on the support, a slide member movably mounted on the support between said flanges, and screw means on the slide member engaging with one of the flanges to exert pressure on the slide member urging it toward the other flange, the body of the telephone being received between the slide member and said other flange, headset jack means on the support for receiving headset plug means, means connecting said jack means to the telephone to establish connections respectively to the terminals of the transmitter and receiver of said handset, two-position substitution switch means on said support having switch sections corresponding to those of the hook switch, manually actuated latchable operating means on said one of the flanges operatively connected to said substitu-

tion switch means, and means connecting said substitution switch means to the hook switch terminals of the telephone such that actuation of said operating means simulates hook switch action, whereby to provide off-hook conditions while the handset remains in said cradle means.

4,092,503

PUSH BUTTON SWITCH OR KEYBOARD ASSEMBLY HAVING FLEXIBLE WIRE CONTACTS

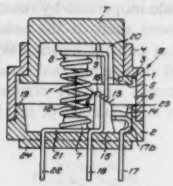
Johan Nils Eskil Raeder, Box 347, 123 03 Farsta, Sweden

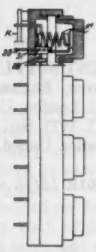
Filed Dec. 17, 1976, Ser. No. 751,824

Claims priority, application Sweden, Dec. 22, 1975, 7514507

Int. Cl.[2] H01H *13/70, 9/16*

U.S. Cl. 200—5 A **14 Claims**





1. A push button type electrical switch comprising:

a housing,

a push button movably supported in said housing,

a helical coil spring also supported in said housing and having a first end thereof urged against said push button to maintain said push button normally in a first position, said spring being compressed in response to actuation of said push button from its first position to a second position,

at least one fixed contact element also supported in said housing,

means connected to said spring at its said first end for selective contacting engagement with said at least one fixed contact element dependent on the position of said push button,

and circuit means connected to said spring,

whereby actuation of said push button between its said first and second positions selectively opens or closes a circuit between said circuit means and through said spring to said at least one fixed contact element.

13. A key set comprising:

a. a first plurality of conductors formed in parallel rows,

b. a second plurality of conductors formed in parallel columns,

c. a plurality of push button switches each associated with a single conductor of a selected row and a single conductor of a selected column,

each said push button switch comprising:

a. a housing,

b. a push button movably supported in said housing,

c. a helical coil spring also supported in said housing and having a first end thereof urged against said push button to maintain said push button normally in a first position, said spring being compressed in response to actuation of said push button from its first condition to a second position,

d. first and second fixed contact elements also supported in said housing and being respectively connected with said first and second plurality of conductors,

e. means connected to said spring at its said first end for selective contact engagement with said first and second fixed contact elements dependent on the position of said push button,

f. and circuit means connected to said spring,

whereby actuation of any said push button between its said first and second positions selectively opens or closes a circuit between said circuit means and through said spring to one or the other of said contact elements.

4,092,504

ELECTRICAL SLIDE SWITCH WITH SELF-CENTERING FLEXIBLE CONTACT

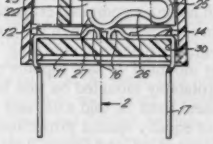
Yasumasa Kotaka, Takatsu, Japan, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 14, 1976, Ser. No. 750,479

Claims priority, application United Kingdom, Dec. 18, 1975, 51987/75

Int. Cl.[2] H01H *15/00*

U.S. Cl. 200—16 D **1 Claim**



1. A slide switch comprising:

a. a base of insulating material having a plurality of channels each extending across the upper surface, further a plurality of apertures positioned adjacent the outer edges of each channel and extending vertically through the base;

b. a plurality of contacts stamped and formed from conductive material, each having a first part providing a leg and a second part providing a contact surface at its free end, said parts being generally at right angles one to the other, said leg extending through an aperture and depending from the base, said second part positioned in the channel with the contact surface facing inwardly and formed into a part cylindrical shape opening downwardly, said contact surface being located near the contact surface of a contact positioned in the same channel and extending inwardly from the opposite side;

c. a box-like cover of insulating material having apertures spaced along its upper surface and mounted on the base thereby providing an interior space, said apertures being in alignment with the channels on the base surface;

d. a plurality of carriers of insulating material, each positioned in the interior space in alignment with an overhead aperture and underlying channel, each carrier having an arm extending through an aperture and a vertical cavity in the undersurface adjacent one end; and

e. a plurality of hairpin-shaped springs stamped and formed from conductive material, each positioned between a channel and an overlying carrier, a first limb of each spring being sinuous with the free end thereof formed in a part cylindrical shape opening upwardly and being in removable electrical engagement with one or both of the contact surfaces in the underlying channel, and a second limb having its free end bent upwardly at right angles

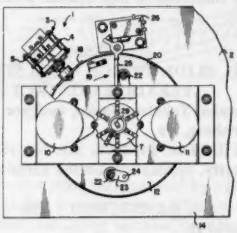
thereto and loosely positioned in the carrier cavity to permit limited sliding movement of the spring independent of the carrier movement so that as the carrier moves the part cylindrical free end on the spring's first limb into engagement with the two facing contact surfaces, the part cylindrical free end centers itself thereinbetween.

4,092,505

TIMER ARRANGEMENT

Lee Caviar, 8216 Walnut, Kansas City, Mo. 64114

Filed Mar. 21, 1977, Ser. No. 779,607
Int. Cl.² H01H *43/10*
U.S. Cl. 200—38 D **7 Claims**



1. A timer program expander for use in an electrical timer having a motor driving a timing disk rotatably mounted on a support member and a plurality of multi-position rotary load selector switches operated by rotation of said disk, each load selector switch having a common terminal making connection one at a time in sequence to each of the load terminals thereof, said timer program expander comprising:

(a) a bracket mounted on said support member;

(b) an axle rotatably mounted on said bracket;

(c) a star wheel fixed on said axle, said star wheel having a plurality of equally spaced projections;

(d) a lug mounted on said timing disk and operative upon engagement with said star wheel to rotate said axle; and

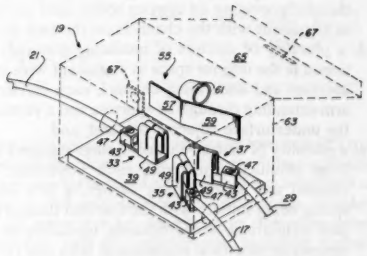
(e) bank selector switch means having a common terminal and a plurality of bank terminals equal to the number of said load selector switches, each of said bank terminals being connected to one of said load selector switch common terminals, said bank selector switch means being operative upon rotation of said axle to make connection one at a time in sequence between said bank selector switch means common terminal and one of said bank terminals.

4,092,506

THEFT PREVENTION SWITCH DEVICE

Cecil Clyde Saulters, 819 W. 27th St., Pueblo, Colo. 81003

Filed Apr. 22, 1977, Ser. No. 789,930
Int. Cl.² H01H *27/00*
U.S. Cl. 200—42 R **34 Claims**



9. A theft prevention apparatus for a vehicle having an electrical system selectively operable off one of at least two battery sources, said apparatus comprising:

first electrical conducting means operably connectable to said electrical system,

second electrical conducting means operably connectable to said first battery source,

third electrical conducting means operably connectable to said second battery source,

each of said electrical conducting means being spaced from the other two, and,

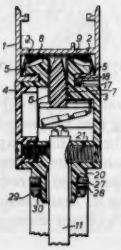
removable means for selectively connecting said first electrical conducting means to said second and third electrical conducting means, said removable means being portable and removable from each of said first, second, and third electrical conducting means whereby said electrical system can be made inoperable by removing said removable means to prevent theft of the vehicle, said removable means including contact means having first and second portions joined at an angle, said removable means further having grip means operably connected to said contact means for easy manipulation of said first and second portions thereof.

4,092,507

ELECTRIC CURRENT SUPPLY INSTALLATION

Tony Lawrence, Newhaven, England, assignor to Rotaflex (Great Britian) Limited, London, United Kingdom

Filed Jan. 17, 1977, Ser. No. 759,859
Claims priority, application United Kingdom, Jan. 19, 1976, 1996/76
Int. Cl.² H01R *13/70, 9/00, 13/54*
U.S. Cl. 200—51 R **8 Claims**

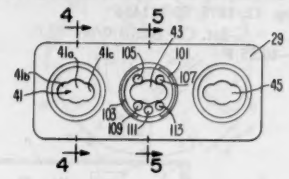


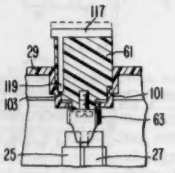
1. In an adaptor for use with an electric current supply installation including a channel-section track member housing at least two longitudinal conductors, the adaptor having an insulated body, a portion for insertion in said track channel, fixed contact fingers and fixed mechanism securing means carried on said adaptor portion, the adaptor being rotatable through 90° to engage mechanically said securing means and said track member and to bring said contact fingers into contact with said conductors, and an electrical switch having switch contacts movable into and out of contact with each other to open and close said switch, one of said switch contacts being electrically connected to one of said contact fingers, and said switch having an operating member, the improvement which comprises means interlocking with said switch operating member to permit operation of said member to close said switch only when the adaptor is in a predetermined rotational position with respect to a track member in which said adaptor portion is inserted.

4,092,508
MODULAR ELECTRICAL CONTROL STATION WITH SWITCH DETENT MEANS

Morton Stanley Rundel, Redwood City, Calif., and Frank R. Keller, Spring House, Pa., assignors to Gould, Inc., Rolling Meadows, Ill.

Filed Jul. 23, 1976, Ser. No. 708,191
Int. Cl.[2] H01H *3/50*
U.S. Cl. 200—291 1 Claim





1. A rotary switch structure that permits easy selection of the number of positive positions, comprising:

a panel having an opening therein through which a stem extends to the rear from its attachment at the front of the panel to an operating knob,

two arcuate tracks provided on the front side of said panel around said opening, each of said tracks extending less than 180° and being positioned on opposite sides of said opening,

a first group of indentations on the front side of said panel arranged in an arcuate path extending less than 180° on one side of said opening,

a second set of a differnt number of indentations on an arcuate path of less than 180° positioned on an opposite side of said opening,

a spring loaded detent provided on the underside of said knob and arranged for engaging said indentations for providing the positive stops of said knob, and

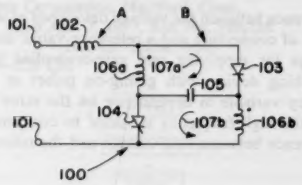
a second detent mechanically operated between a position for riding in either of said circular tracks and another position removed therefrom, whereby the knob may be mechanically selected for operation with respect to said first set of indentations or said second set of indentations as desired.

4,092,509
INDUCTION HEATING APPLIANCE CIRCUIT THAT PRODUCES RELATIVELY HIGH FREQUENCY SIGNALS DIRECTLY FROM A RELATIVELY LOW FREQUENCY AC POWER INPUT

McLaren P. Mitchell, 11902 Laurel Hills Rd., Studio City, Calif. 91604

Filed May 12, 1975, Ser. No. 576,250
Int. Cl.[2] H05B *5/04*
U.S. Cl. 219—10.75 21 Claims

1. A cooking appliance, comprising an inductive heating element for inductively heating a magnetically responsive utensil positioned over an electrically nonconductive gap away from said inductive heating element; and high frequency current fed inverter means for generating directly from a relatively low frequency AC power input signal high frequency electric signals to energize said inductive heating element whereby the latter produces a magnetic flux output signal for effecting inductive heating of such magnetically responsive utensil; said high frequency current fed inverter means comprising a low frequency circuit portion and a high frequency circuit portion, the latter comprising a bridge circuit having four side arms and a diagonal arm; said low frequency circuit portion comprising input means for receiving such AC power input signal, and a relatively large input inductor having a magnitude of inductance such that said input inductor appears as a relatively low impedance to such AC power input signal and as a relatively high impedance to high frequency signals in said high frequency circuit portion thereby to reduce feedback of such high frequency signals to said input means and the sources of such AC power input signal; said high frequency circuit portion being coupled to said low frequency circuit portion and comprising at least one inductor, at least one capacitor, and high frequency switch means for periodically



connecting said at least one inductor and said at least one capacitor in a high frequency LC resonant circuit in response to high frequency gating signals supplied to said high frequency switch means to close the same, said input inductor in said low frequency circuit portion being coupled to said high frequency circuit portion and further having a magnitude of inductance to provide relatively constant current during respective cycles of such high frequency signals to charge said at least one capacitor when said high frequency switch means is open, said at least one capacitor being coupled relative to said high frequency switch means and said at least one inductor for supplying a high frequency discharge current through said at least one inductor when said high frequency switch means is closed, and said high frequency switch means being coupled to said at least one capacitor and said at least one inductor to receive the reverse resonant current and voltage in said high frequency LC resonant circuit to effect cut off and opening of said high frequency switch means.

4,092,510
MULTIPLE-LOAD INDUCTION HEATING COOKING APPARATUS WITH MEANS FOR ELIMINATING INTERFERENCE BETWEEN TWO OR MORE COMMUTATION CIRCUITS

Mitsuyuki Kiuchi; Takumi Mizukawa; Hideyuki Kominami, and Keizo Amagami, all of Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Limited, Japan

Filed Oct. 15, 1976, Ser. No. 732,660
Claims priority, application Japan, Oct. 22, 1975, 50-127688; Nov. 5, 1975, 50-133243; Dec. 4, 1975, 50-144874
Int. Cl.[2] H05B *5/04*
U.S. Cl. 219—10.49 R 7 Claims

1. An induction heating apparatus comprising:

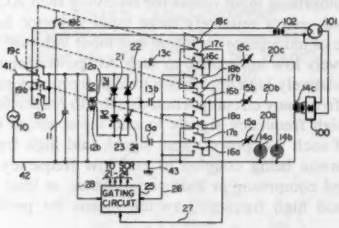
a. at least one gate-controlled bidirectional switching device having a pair of main terminals connectable in use to a source of low frequency voltage;

b. a plurality of commutation circuits each including a commutating capacitor and a commutating inductor including an induction heating work coil inductively coupled with a magnetic load to be heated;

c. means for selectively connecting the commutation circuits

in parallel circuit relationship to the main terminals of the bidirectional switching device and junction between the commutating capacitor and the commutating inductor of said parallel-connected commutation circuits to a common point;

d. means for generating an error signal representative of the



difference between the voltage developed at said common point of connection and a reference value; and

e. means for supplying said gate-controlled bidirectional switching device with gating-on pulses at a high frequency variable in dependence on the error signal such that the high frequency is varied to compensate for the difference between said voltage and the reference value.

4,092,511

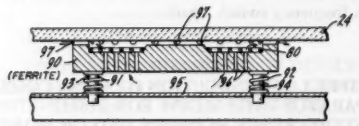
WORK COIL FOR USE IN AN INDUCTION COOKING APPLIANCE

Buddy Julian Austin, Lafayette, Ind., assignor to Roper Corporation, Kankakee, Ill.

Division of Ser. No. 518,773, Oct. 29, 1974, Pat. No. 4,029,926. This application Jan. 3, 1977, Ser. No. 756,059

Int. Cl.[2] H05B 9/02

U.S. Cl. 219—10.49 R **7 Claims**



1. In a solid state induction cooking appliance for producing heat in a metallic utensil by means of an ultrasonic frequency magnetic field, said appliance including a solid state inverter having a resonant circuit comprising a capacitor and an inductor, an improved work coil for generating the ultrasonic frequency magnetic field and coupling said field to the utensil comprising a solid single strand substantially round conductor, said conductor being wound in a single layer spiral to form a substantially flat coil, the winding pitch being related to the radial thickness of the conductor by a thickness to pitch ratio in the range between 0.3 and 0.9 said work coil being connected as the inductor in said inverter and having sufficient inductance for resonating with said capacitor at an ultrasonic frequency whereby resonant exchange of energy between said work coil and capacitor causes said work coil to generate said ultrasonic frequency magnetic field.

4,092,512

TURNTABLE DRIVE MECHANISM IN ELECTRONIC OVEN

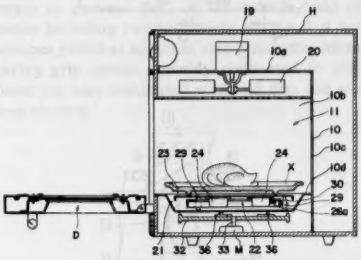
Ryuji Suzuki; Kimiaki Yamaguchi; Shunichi Nagamoto; Takashi Niwa, all of Nara, and Haruo Matsushima, Yamatokoriyama, all of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Kadoma, Japan

Filed Aug. 18, 1976, Ser. No. 715,644

Claims priority, application Japan, Aug. 27, 1975, 50-104376; Sep. 2, 1975, 50-106736; Sep. 3, 1975, 50-107197; Sep. 9, 1975, 50-109688; Sep. 12, 1975, 50-111436

Int. Cl.[2] H05B 9/06

U.S. Cl. 219—10.55 F **22 Claims**



1. In an electronic oven comprising a substantially cubic oven-defining structure having a bottom wall and an access opening leading into the interior of the oven-defining structure above the bottom wall, means positioned for generating high frequency energy towards the interior of the oven-defining structure, and a hingedly supported door for selectively opening and closing the access opening of the oven-defining structure for insertion into and removal from the interior of the oven-defining structure a material to be heat-treated by the high frequency energy, respectively, a turntable drive mechanism which comprises:

a turntable assembly for the support of a material to be heat-treated by the application of the high frequency energy within the interior of the oven-defining structure, said turntable assembly being removably positioned on the bottom wall of the oven-defining structure for rotation about its own center and having a rotation guiding and supporting structure thereon consisting of a plurality of three or more rollers, through which the turntable assembly is rotatably mounted on the bottom wall of the oven-defining structure, and means for connecting said rollers to said turntable assembly; a plurality of magnetic members carried by said turntable assembly;

a drive mechanism positioned below the bottom wall of the oven-defining structure and externally of the interior of the oven-defining structure;

a rotary carriage operatively coupled to said drive mechanism and positioned below the bottom wall of and externally of the interior of the oven-defining structure for rotation in one direction; and

magnetic members equal in number to the number of the magnetic members carried by the turntable assembly and carried by said rotary carriage;

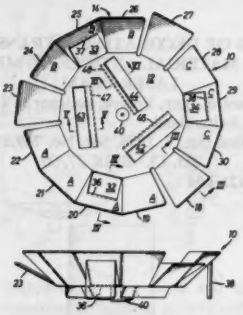
said turntable assembly being, during rotation of said rotary carriage, rotated by the effect of magnetic coupling between the magnetic members, carried by the turntable assembly, and the magnetic members carried by the rotary carriage.

4,092,513

STIRRER HUB ASSEMBLY

Glenn O. Rasmussen, St. Paul, Minn., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Jan. 31, 1977, Ser. No. 764,279
Int. Cl.[2] H05B 9/06
U.S. Cl. 219—10.55 F 3 Claims



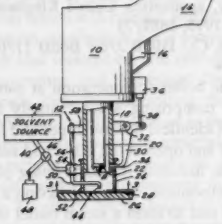
1. A field stirrer for a microwave oven, said stirrer being of the type having an upwardly concave pan shape and being formed as a sheet metal stamping, said stirrer comprising a central planar section and a surrounding section comprising a plurality of circumferentially arranged segments with planar surfaces and being shaped like equilateral trapezoids, said surrounding section having three circumferentially spaced segment groups in which the individual segments thereof slope upwardly at an angle of approximately 45° relative to said planar section, each of said segment groups including at least three of said segments which are laterally joined by folded edges and wherein at least one segment in each of said segment groups has a rectangularly shaped opening with a rectangularly shaped flap extending downwardly from the upper edge of said opening, said plurality of segments including three individually mounted segments arranged alternately relative to said three segment groups and in circumferentially spaced relation thereto, said three segments sloping upwardly at an angle of approximately 27° relative to said central planar section.

4,092,514

METHOD FOR WELDING THROUGH PAINT

Ralph M. Burton, Grosse Pointe, Mich., assignor to USM Corporation, Boston, Mass.

Filed Sep. 18, 1975, Ser. No. 614,367
Int. Cl.[2] B23K 11/00
U.S. Cl. 219—99 8 Claims



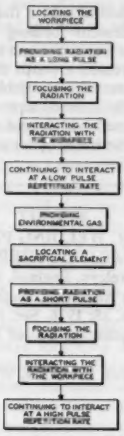
1. The method of electric welding a metal part to an electrically insulatively coated metallic surface which comprises:
   1. directing a vapor jet of a solvent for the insulative coating into contact with a local area of the coating on the metallic surface and for a time period sufficient to soften and render flowable the coating in said area,
   2. continuing the application of said vapor jet to said local area to dislodge the softened flowable coating at least to one side of said local area in order to expose an uncoated bare spot of the metallic surface.
   3. discontinuing the application of said vapor jet to said local area, and
   4. electric welding the metal part to a portion of the exposed bare spot of the metallic surface before the softened coating reflows back over the remainder of the bare spot to the weld line and then following the electric welding of the metal part to the exposed bare spot of the metallic surface allowing the softened coating to reflow to the weld line to form a protective coating thereover.

4,092,515

LASER METHOD OF PRECISION HOLE DRILLING

Frederick R. Joslin, Lebanon; Gary E. Palma, Rocky Hill, and Gary L. Whitney, Windsor, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 7, 1977, Ser. No. 785,726
Int. Cl.[2] B23K 9/00
U.S. Cl. 219—121 LM 16 Claims


LOCATING THE WORKPIECE
PROVIDING RADIATION AS A LONG PULSE
FOCUSING THE RADIATION
INTERACTING THE RADIATION WITH THE WORKPIECE
CONTINUING TO INTERACT AT A LOW PULSE REPETITION RATE
PROVIDING ENVIRONMENTAL GAS
LOCATING A SACRIFICIAL ELEMENT
PROVIDING RADIATION AS A SHORT PULSE
FOCUSING THE RADIATION
INTERACTING THE RADIATION WITH THE WORKPIECE
CONTINUING TO INTERACT AT A HIGH PULSE REPETITION RATE

1. The method for obtaining a hole essentially free of a recast layer and heat affected zone in a workpiece with laser radiation including in combination the steps of:
   locating the workpiece in an environmental gas capable of oxidizing vaporized workpiece material to form an oxide of the vapor which does not adhere to the workpiece material;
   providing laser radiation as a pulse having a duration comparable to the time required to vaporize workpiece material;
   focusing the radiation to obtain a power density capable of vaporizing the workpiece material; and
   interacting the radiation with the workpiece to vaporize workpiece material and allow the gas to oxidize the vapor.

4,092,516

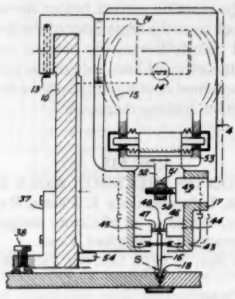
SEALING DEVICE FOR A VACUUM ENCLOSURE

Philippe Martin, Orsay, France, assignor to Commissariat a l'Energie Atomique, Paris Cedex and Soudure Autogene Francaise, Paris, both of, France

Filed Apr. 26, 1977, Ser. No. 790,883
Claims priority, application France, Apr. 28, 1976, 76 12572
Int. Cl.[2] B23K 9/00
U.S. Cl. 219—121 EB 7 Claims

1. A sealing device for a vacuum enclosure containing a

movable support for an electron gun for electron-beam welding of two parts which are abuttingly applied against each other and on which the support and the enclosure rest, wherein said enclosure surrounds the electron gun support and is entirely independent of said support and includes a first element separable from a second element, said first element being a frame, seals on one face of said frame for vacuum-tightness upon application against the parts to be welded, another face of



said frame being applied against a flange on said second element, said second element forming a bell-housing applied against said frame, the frame being a hollow structure having an internal surface directed towards the interior of the enclosure, orifices in said structure establishing communication with a duct for pumping the internal atmosphere when a primary vacuum is being created within said enclosure, said support being rigidly fixed to the frame by locking means released prior to the welding operation.

4,092,517

ELECTRIC ARC WELDING PROCESSES AND APPARATUS THEREFOR

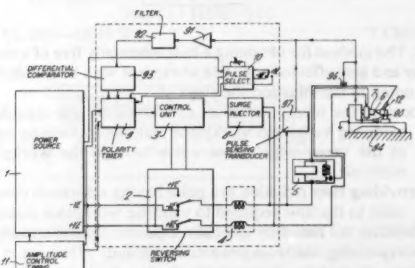
Albert Woodacre, Cleveleys, England, assignor to United Kingdom Atomic Energy Authority, England

Filed Feb. 25, 1976, Ser. No. 661,363

Claims priority, application United Kingdom, Mar. 6, 1975, 9473/75

Int. Cl.[2] B23K *9/10*

U.S. Cl. 219—137 PS **14 Claims**



4. An electric arc-welding process in which an alternating current is supplied to a welding electrode to produce an electric arc between the said electrode and a workpiece, each cycle of said current having a positive pulse and a negative pulse, wherein the improvement comprises monitoring with a sensing means a characteristic of the electric arc region to generate a signal from the sensing means on the occurence of changes in the welding conditions, and which characteristic changes as welding conditions of the electric arc change, comparing the generated signal with a reference signal in a comparing means to provide an output from the comparing means to an alternating current pulse width control means in response to any difference between the two signals, and varying the ratio of the durations of the positive and negative pulses with respect to each other in each cycle in response to said output to bring the varying generating signal and the reference signal substantially in balance.

4,092,518

METHOD OF DECORATING A TRANSPARENT PLASTICS MATERIAL ARTICLE BY MEANS OF A LASER BEAM

René Rémy Merard, Igny, France, assignor to Laser Technique S.A., Buren, Switzerland

Filed Dec. 7, 1976, Ser. No. 749,271

Int. Cl.[2] B23K *27/00*

U.S. Cl. 219—121 LM **3 Claims**

1. A method for the decoration of a transparent plastics material article comprising the steps of providing an article having a transparent plastics material body to be decorated, said article body to be decorated having internal stresses and a crystalline character, and directing a pulsed laser beam into the body of said article, said laser beam being successively focussed by an optical focussing system in different regions within the body of said article, said pulse energy and said pulse duration being selected in dependence upon the extent of the desired decorative features.

4,092,519

ELECTRODE BOILER

Raymond Herbert Eaton-Williams, "Heathers", Farnaby Drive, Sevenoaks, Kent, England

Filed Jan. 30, 1976, Ser. No. 653,782

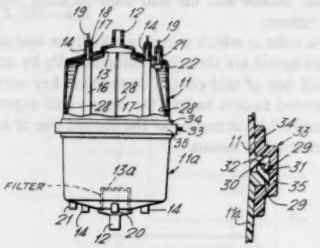
Claims priority, application United Kingdom, Feb. 5, 1975, 4888/75; Feb. 5, 1975, 4889/75

Int. Cl.[2] H05B *3/60*; B65D *11/00*

U.S. Cl. 219—284 **7 Claims**

1. An electrode boiler for operation at substantially atmospheric pressure comprising a substantially cylindrical container made up of identical hollow upper and lower parts each closed at one end and open at the other end and moulded from a synthetic plastic material, the parts being placed with their open ends in juxtaposition, each part having a central connection at its closed end to form a steam outlet in the upper part and a water connection in the lower part, each part being formed with bosses which, in the upper part, are drilled through, a plurality of electrodes mounted in the drilled bosses, a circumferential enlargement forming a bead around the open end of each part, each bead being defined by a flat annular surface at the open end, a cylindrical portion extending from

the flat surface, and a tapered portion extending from the cylindrical portion, indexing means on the annular flat surfaces to locate the two parts against relative rotation or transverse movement, and an endless elastic member around the two beads, the elastic member having two ring-shaped portions



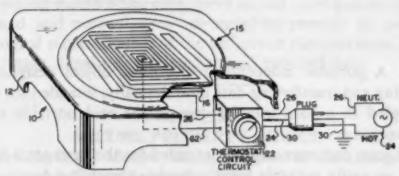
which closely embrace the two parts and an intermediate raised portion containing an internal groove with tapered sides corresponding with the tapered portions of the beads, the elastic member serving to draw the two parts together in their relatively located positions and to provide a liquid seal.

4,092,520

LEAKAGE CURRENT THERMOSTAT

Richard D. Holmes, and Cheng L. Wang, both of Silver Spring, Md., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Dec. 16, 1976, Ser. No. 751,241
Int. Cl.[2] H05B *1/02*
U.S. Cl. 219—504 **8 Claims**



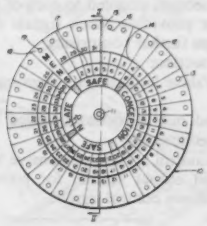
1. An electric heater assembly including a heating element, electrical supply lines to said heating element, electrically insulating material which is in contact with at least a portion of said heating element, and which has a temperature-resistance relationship such that leakage current therethrough is a steep function of temperature, and thermostat control means coupled to said supply lines for controlling the current to said heating element in response to a change in the leakage current through said electrically insulating material, said thermostat control means includes a first electronic switching device having a first gate and being connected in series with said heating element, a voltage dividing circuit with at least two impedances therein connected in series across said supply lines with the junction between said impedances being connected to said first gate, a second electronic switching device having a second gate and being connected between said first gate and one of said supply lines, said material being connected to said second gate, and an impedance coupled between said second gate and the system ground.

4,092,521

MENSTRUAL CALCULATOR

Manfred E. Weisshaar, 917 Greendale Dr., Windsor, Ontario, Canada (N8S 4B2)

Filed May 4, 1976, Ser. No. 682,959
Int. Cl.[2] G06C *3/00*
U.S. Cl. 235—88 RC **12 Claims**



1. A dial calculator for determining periods of fertility and sterility in a current menstrual cycle of a human female, comprising:

first and second discs divided into a plurality of equal segments with each disc having an annular display of first indicia disposed along substantially the entire periphery thereof, said indicia representing thirty-one days of a calendar month and occupying corresponding ones of the segments in the discs, the second disc being smaller than the first disc and adapted to be rotatably set in coaxial relation therewith so that the indicia of the second disc follow consecutively on a shorter radius a first predetermined one of the indicia of the first disc; and

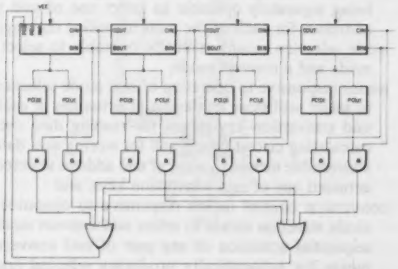
a third disc divided into said plurality of equal segments and being adapted to be rotatably set in coaxial relation with the second disc in respect of a second predetermined one of the indicia on the first disc, the third disc being smaller than the second disc and including an annular display of second indicia disposed along substantially the entire periphery thereof, said second indicia being arranged to display complete days following said second predetermined one of the indicia of the first disc and representing at least the days of a normal menstrual cycle including the periods of fertility and sterility and relating said days to the consecutively arranged indicia of the first and second discs.

4,092,522

5-BIT COUNTER/SHIFT REGISTER UTILIZING CURRENT MODE LOGIC

Homer Warner Miller, Peoria, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Jan. 3, 1977, Ser. No. 756,463
Int. Cl.[2] G06F *11/10*
U.S. Cl. 235—308 **8 Claims**



1. A plural bit, D-type master/slave up-down counter/shift

register with reset, load, and parity check capabilities, comprising:

a plurality of data stages;

a parity section coupled to the last of said plurality of data stages for enabling said last data stage to act as a parity bit;

a control section coupled to each of said plurality of data stages for providing control signals to each of said stages; and

a clocking section, coupled to each of said plurality of data stages for providing clock signals thereto, each of said data stages further comprising:

an input section;

a master/slave latch section responsive to said input section;

a buffered output section coupled to said master/slave latch section; and

a count control section responsive to the output of said buffered output section for providing count-up and count-down control signals.

4,092,523

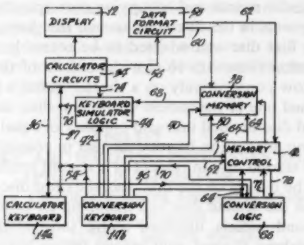
CONVERSION CALCULATOR

Paul Tava, 45 Vassar La., Hicksville, N.Y. 11801, and Steven S. Herrick, 2204 Clapboard Hill Rd., Little Rock, Ark. 72207

Filed Aug. 16, 1976, Ser. No. 714,590

Int. Cl.[2] G06F *3/02*

U.S. Cl. 235—310 **13 Claims**



1. An electronic calculator for automatically converting numerical data representative of a value expressed in an initial one of a plurality of variably related units to numerical data representative of the same value expressed in any other one of said plurality of variably related units comprising:

calculating circuit means for performing calculations on numerical data in accordance with operational commands and for producing a variety of outputs;

input keyboard means selectively operable to produce inputs for said calculating circuit means representative of numerical data and of operational commands;

addressable memory means for separately storing numerical data at each one of a plurality of different selectable memory addresses;

a plurality of manually actuatable conversion key means, each identifying at least one of said plurality of units and being separately operable to select one of said memory addresses for each of the units identified thereby;

mode selection means manually operable to select a store mode and a convert mode;

means responsive to operation of said mode selection means to select said store mode and to actuation of each one of said conversion key means for reading data out of said calculating circuit means and for storing said data in said addressable memory means at said address selected by said actuated one of said conversion keys; and

conversion control means responsive to operation of said mode selection means to select said convert mode and to sequential actuation of any pair of said conversion key means for automatically producing selected operational command signals, for automatically recalling data from the sequentially selected addresses of said memory means, and for effecting applicaion of said operational command signals and of data signals recalled from said memory means to said calculating circuit means to cause said calculating circuit means to perform calculations corresponding to said operational command signals produced by said conversion control means on data initially in said calculating circuit means and on said data recalled from said memory means;

whereby the units in which said data initially in said calculating circuit means are identified automatically by actuation of the first one of said pair of conversion key means and are converted to data having the same value expressed in units identified by actuation of the second one of said pair of conversion key means.

4,092,524

SYSTEMS FOR STORING AND TRANSFERRING DATA

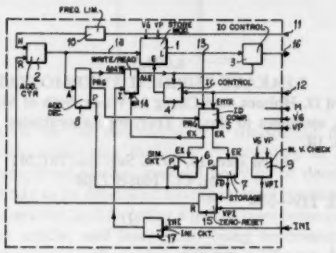
Roland Moreno, Paris, France, assignor to Societe Internationale pour l'Innovation, France

Filed May 13, 1976, Ser. No. 686,095

Claims priority, application France, May 13, 1975, 75 14808

Int. Cl.[2] G06K *5/00, 19/06;* G11C *15/04*

U.S. Cl. 235—419 **27 Claims**



1. A portable independent electronic object designed for storing and transferring data confidentially, intended for being coupled to a data transfer device; the said portable object comprising:

at least one store module intended for the storage of data in an easily portable form, containing enabling data,

coupling means accessible from outside the portable object, enabling the said portable object to be coupled temporarily with the said transfer device,

circuits for control of the store, interconnected between the coupling means and the store; the said store and the control circuits being produced in the form of logical microstructures;

an identification comparator connected to the store and to the coupling means, intended for comparing the enabling data contained in the store with a confidential code supplied by the rightful owner of the portable object and introduced into the portable object by way of the said transfer device;

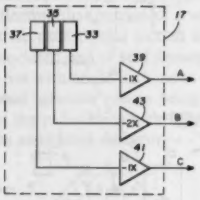
the said portable object being characterized in that it includes in addition:

a circuit for storage of the errors in confidential code, connected to the identification comparator, intended to keep track permanently of the errors in confidential code, the said storage circuit comprising at least one store element composed of a permanent store.

4,092,525
CODE READING APPARATUS

Henry A. Daboub, Dallas; Charles R. Henderson, Grand Prairie, and Chris A. Balthrop, Bedford, all of Tex., assignors to E-Systems, Inc., Dallas, Tex.

Continuation of Ser. No. 525,387, Nov. 20, 1974, abandoned.
This application May 6, 1976, Ser. No. 683,981
Int. Cl.[2] G06K 7/10, 9/00
U.S. Cl. 235—463 16 Claims



1. A recognition apparatus for reading encoded data carried by an object moving with respect to a reading station, along a travel path, the recognition apparatus comprising:

reading means for reading the encoded data, said reading means being responsive to the encoded data for providing first, second and third data signals which vary correspondingly in magnitude with the encoded data, said reading means including means effective to time displace said second and third data signals from said first data signal by predetermined amounts, said reading means further including amplification means responsive to said first, second and third data signals for providing first, second and third electrical signals, respectively, said amplification means being operable to vary the magnitude of said second data signal relative to said first and third data signals;

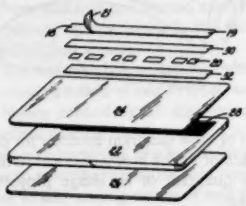
summing means connected to said amplification means, said summing means being operable to sum said first and third electrical signals to provide a combination signal representative thereof; and

difference determining means connected to said summing means and said amplification means, said difference determining means being responsive to said combination signal and said second electrical signal to provide an output signal representative of the difference therebetween, said output signal being related to said encoded data.

4,092,526
SECURE PROPERTY DEVICE

Charles K. Beck, Mentor, Ohio, assignor to Addressograph-Multigraph Corp., Cleveland, Ohio

Filed May 27, 1976, Ser. No. 690,586
Int. Cl.[2] G06K 19/08; B42D 15/00
U.S. Cl. 235—487 38 Claims

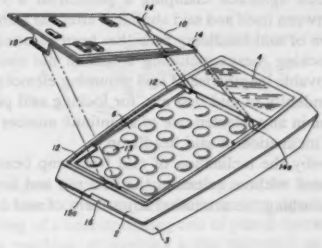


1. A secure property device comprising a magnetic recording member and at least one radiant energy reflecting element, said element being secured to said magnetic recording member by means of a specularity enhancing adhesive composition comprised of a copolymer of monomers selected from the group consisting of lower alkyl acrylates and lower alkyl methacrylates.

4,092,527
CALCULATOR WITH INTERCHANGEABLE KEYSET

Gerald Luecke, Rockwall, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 31, 1977, Ser. No. 764,109
Int. Cl.[2] G06F 7/38, 15/02
U.S. Cl. 364—709 12 Claims



1. An apparatus comprising:

(a) an integrated circuit,

(b) a display for displaying a number outputted by said integrated circuit,

(c) an array of key switches for inputting numeric and functional data to said integrated circuit,

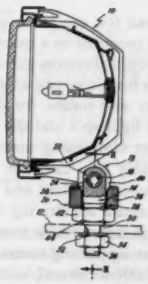
(d) an array of key switch push buttons moveably disposed in openings in a member retaining said array of key switch push buttons, and

(e) a case in which said integrated circuit, display and array of key switches are installed during manufacture and having means for removably receiving said member retaining said array of key switch push buttons, said array of key switch push buttons being operationally disposed adjacent to said array of key switches when removably received in said case, said receiving means being adapted for operation by an operator of said apparatus for temporarily receiving said array of key switch push buttons after manufacture of said apparatus.

4,092,528
ACCESSORY HEADLAMP MOUNTINGS

Olivier Puyplat, Paris, France, assignor to Cibie Projecteurs, Bobigny, France

Filed Jun. 8, 1976, Ser. No. 694,111
Claims priority, application France, Jun. 18, 1975, 75 19084
Int. Cl.[2] B60Q 1/00
U.S. Cl. 362—427 5 Claims



1. An accessory headlamp arrangement comprising:

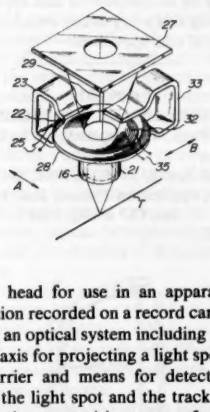
(a) an accessory headlamp,
(b) an elongate mounting element having a body and a stem at one end of said body, said stem and body both being externally threaded,
(c) an abutment between said threaded stem and the body of said mounting element, said abutment being of larger diameter than the diameter of said stem,
(d) a pivot connection between said headlamp and the end of said mounting element opposite said stem for permitting infinite variation of the inclination of said headlamp beam,
(e) a first nut threadably mounted on said stem, said first nut when tightened clamping a portion of a vehicle body between itself and said abutment after the azimuthal direction of said headlamp beam has been adjusted, and
(f) locking means including a second nut carried by and movable lengthwise of said mounting element body, independently of said first nut, for locking said pivot connection in any selected one of an infinite number of positions of inclination of said headlamp,
whereby the inclination of said headlamp bean can be adjusted without releasing the first nut and hence without disturbing the azimuthal adjustment of said headlamp.

4,092,529

DETECTING HEAD FOR USE IN AN APPARATUS FOR READING OPTICALLY AN INFORMATION RECORDED ON A RECORD CARRIER AS A TRACK OR TRACKS

Takayuki Aihara, Hachioji; Kiyoshi Hori, Hino, and Tadashi Morokuma, Tokyo, all of Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

Filed Oct. 7, 1976, Ser. No. 730,608
Claims priority, application Japan, Oct. 8, 1975, 50-120765; Oct. 31, 1975, 50-130527; Oct. 31, 1975, 50-130528
Int. Cl.[2] G01J *1/20*
U.S. Cl. 250—201 **11 Claims**



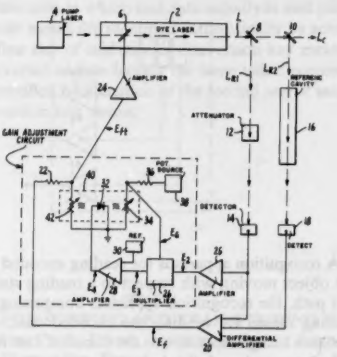
1. A detecting head for use in an apparatus for reading optically information recorded on a record carrier as a track or tracks comprising an optical system including a projection lens having an optical axis for projecting a light spot on the surface of the record carrier and means for detecting the relative position between the light spot and the track to be read, said optical system further comprising means for supporting the projection lens movably in a direction perpendicular to the optical axis of the projection lens and perpendicular to the track direction and means for driving the projection lens in said direction in which it is movable comprising a coil secured to said projection lens supporting means and a magnet having pole pieces arranged across the coil, and means connecting the position detecting means and said coil of the driving means such that a signal supplied from said position detecting means is supplied to said coil of the driving means.

4,092,530

FEEDBACK LOOP CONTROL SYSTEM EMPLOYING METHOD AND APPARATUS FOR STABILIZING TOTAL LOOP GAIN AND BANDWIDTH

William L. Wise, Mountain View, Calif., assignor to Coherent, Inc., Palo Alto, Calif.

Filed Jul. 1, 1976, Ser. No. 701,856
Int. Cl.[2] G01J *1/32*
U.S. Cl. 250—205 **11 Claims**



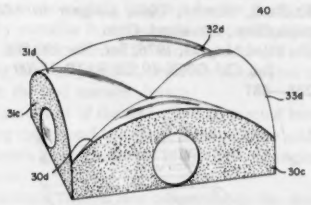
1. A feedback loop control system for controlling an element which has a variable gain and which produces an output signal proportional to said element gain, comprising
means for generating a feedback signal corresponding to the difference between a desired value of an element operating parameter and the actual value of said operating parameter in said element output signal, and
means for compensating said feedback signal for variations in said element gain by applying to said feedback signal a corresponding signal which varies inversely with said element gain variations, whereby the total loop gain and bandwidth of the element control loop may be stabilized despite variations in the gain of the controlled element.

4,092,531

IMMERSED REFLECTOR QUADRANT DETECTOR

Gaylord E. Moss, Thousand Oaks, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 16, 1976, Ser. No. 742,317
Int. Cl.[2] H01J *3/14*
U.S. Cl. 250—216 **9 Claims**



1. A wide field of view quadrant detector for providing four output signals each of which is proportional to the intensity of radiation in one quadrant of an image projected onto said device comprising:
a. four separate optical detectors of which one is associated with each of said quadrants;
b. optical reflector means immersed in a high refractive index transparent material, said material having a first surface shaped and positioned for receiving said projected image from a lower refractive index medium and for

refracting and transmitting said image to a second surface of said transparent material along a first optic axis;

c. said second surface of said material being divided into four quadrants, each of said quadrants of said second surface being a portion of a surface of revolution, all of said quadrants of said second surface meeting at a common intersection point which lies on both said first optic axis and said second surface;

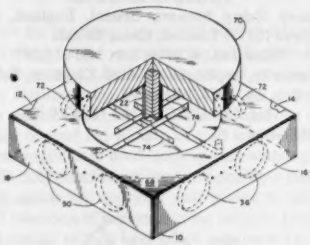
d. said reflector means being formed on all of said quadrants of said second surface for dividing said projected radiation in said image by reflecting that portion of it which falls on the reflector means on each of said second surface quadrants toward an associated one of said detectors along an optical path which lies within said high index of refraction material, each of said reflector means being shaped and positioned to direct the radiation which falls on its quadrant only toward its associated detector.

4,092,532

BINARY APPARATUS FOR MOTION CONTROL

Patrick Dewey Hayes, San Diego, Calif., assignor to The United Sates of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 10, 1976, Ser. No. 740,514
Int. Cl.[2] H01J *39/12*
U.S. Cl. 250—221 **13 Claims**



1. An apparatus for directing the motion of a movable element, said apparatus comprising:

a. first and second arrays of radiant energy sensing means, each of said sensing means providing an output which defines a binary bit of a first logic level when activated, and which defines a binary bit of a second logic level when deactivated;

b. a selected number of radiant energy sources spatially separated from said first and second arrays for projecting activating radiant energy towards the sensing means of said first and second arrays;

c. a control element which is spatially positionable in relation to the sensing means of said first and second arrays to provide a binary control signal, discrete spatial positions of said control element being represented therein, said control element comprising first means for engagement by an operator to selectively position said control element in said relation to said sensing means of said first and second arrays and second means for urging said control element to a predetermined rest position; and

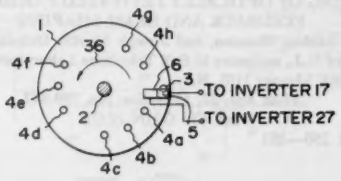
d. a control signal conversion means coupled to receive said binary control signal and responsive thereto for generating a selected number of motion control signals determinative of the motion of said movable element.

4,092,533

TIMING SIGNAL GENERATING DEVICE

Kyoichi Ohsako, Tokyo, and Katsuyoshi Oyama, Ohi, both of Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed May 17, 1976, Ser. No. 687,222
Int. Cl.[2] G01D *5/34*
U.S. Cl. 250—231 SE **8 Claims**



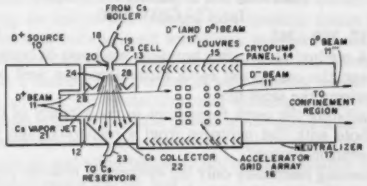
1. A timing signal device for generating, on the basis of angular displacement of a rotating shaft, timing signals for controlling timing of a corresponding one of plural operations performed in a machine, comprising a disc mounted on said shaft to be rotatable therewith and having a reference mark disposed at a point having a first radius and a plurality of timing marks disposed angularly apart from one another on a circle of a second radius different from said first radius, reference mark detecting means and timing mark detecting means located relative to said disc to detect said reference mark and said timing marks, respectively, for generating a pulse signal in response to passage of each of said marks by the associated detecting means as the disc rotates, shift register means for counting said pulse signals, said reference mark detecting means having an output terminal connected to a clear terminal of said shift register means, and said timing mark detecting means having an output terminal connected to an input terminal of said shift register means, a plurality of gate means, the number of said gate means being equal to the number of said operations performed in the machine, each of said gate means having at least one input terminal each connected to an output terminal of a predetermined step of said shift register means so that the gate means generates a timing signal having information concerning starting time and terminating time of the corresponding operation.

4,092,534

CHARGE EXCHANGE SYSTEM

Oscar A. Anderson, Berkeley, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 19, 1976, Ser. No. 743,375
Int. Cl.[2] G01N *27/78*
U.S. Cl. 250—251 **6 Claims**



1. A method for substantially reducing pumping requirements of excess gas in a neutral beam injector having an energy ranging from about 150 keV to about 200 keV comprising the steps of: passing a beam of particles consisting essentially of a D+ beam through a baffled charge exchange cell containing a vapor consisting essentially of cesium vapor and produced by

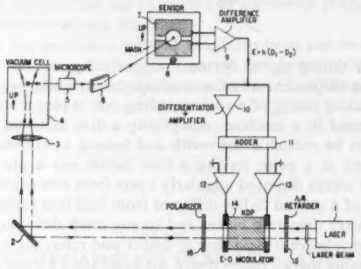
directing a jet of vapor from a supersonic nozzle across the beam which converts the particles to negative ions; accelerating the thus-produced ions to energies in the range of about 150–200 keV; and then neutralizing the thus-accelerated ions; the vapor in the baffled charge exchange cell acting simultaneously as the charge exchange medium and as a shield for reflecting excess gas.

4,092,535

DAMPING OF OPTICALLY LEVITATED PARTICLES BY FEEDBACK AND BEAM SHAPING

Arthur Ashkin, Rumson, and Joseph Martin Dziedzic, Clark, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 22, 1977, Ser. No. 789,847
Int. Cl.[2] G01N *21/78*
U.S. Cl. 250—251 **9 Claims**



1. An optical levitation device for supporting a particle comprising

means for producing a substantially vertical supporting beam of coherent optical radiation having a radial intensity distribution,

means responsive to the vertical position of said particle for controlling the power of said supporting beam in such a manner that said particle is supported at a desired position and so that perturbations of the vertical position of the particle are damped, and

means for altering, by adjustment of said radial intensity distribution of said supporting beam, the amount of vertical perturbation in the position of the particle that results from a horizontal perturbation, whereby perturbations of the horizontal position of the particle are damped by controlling the power of said supporting beam.

4,092,536

METHOD FOR DETECTING CEMENT VOIDS OR BOREHOLE WASHOUTS

Michael P. Smith, Bellaire, Tex., assignor to Texaco Inc., New York, N.Y.

Filed May 27, 1976, Ser. No. 690,500
Int. Cl.[2] G01V *5/00*
U.S. Cl. 250—265 **5 Claims**

1. A method for locating borehole washouts or cement voids between the casing and earth formations in a well borehole, comprising the steps of:

irradiating the earth formations in the vicinity of the borehole with fast neutrons from a relatively high intensity neutron source;

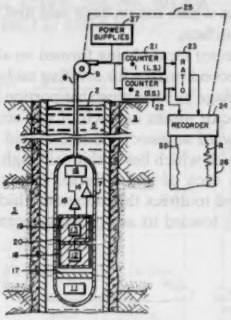
detecting essentially only the epithermal neutron population at a first shorter spaced distance from said source in the borehole;

detecting essentially only the epithermal neutron population at a second longer spaced distance from said source in the borehole;

discriminating against the detection of the thermal neutron population at said detectors in the borehole;

combining the epithermal neutron population measurements made at said two different spaced distances by taking a ratio of said epithermal neutron population measurements to derive a first, compensated, indication of formation porosity;

deriving a second, uncompensated, indication of formation



porosity from said measurement of the epithermal neutron population at said shorter spaced distance alone; and

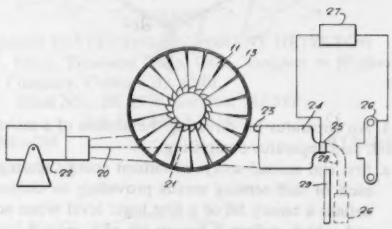
comparing said compensated and said uncompensated porosity indications by deriving a percentage compensation parameter C to locate the presence of borehole washouts or cement voids.

4,092,537

DIAGNOSTIC APPARATUS AND METHOD FOR GAS TURBINE ENGINES

Peter Antony Eabry Stewart, Bristol, England, assignor to Rolls-Royce (1971) Limited, Great Britain

Filed Feb. 4, 1976, Ser. No. 655,097
Claims priority, application United Kingdom, Feb. 12, 1975, 06040/75; Sep. 18, 1975, 38311/75
Int. Cl.[2] G03B *35/00*; G03C *9/00*
U.S. Cl. 250—314 **11 Claims**



1. A method of observing the passage of foreign objects through an operating gas turbine engine comprising the steps of:

(a) energizing a means to produce beams of electromagnetic radiation in the energy range 150KV to 12 Mev each beam being of power greater than 50 rads per minute at a meter, said means having a substantially constant average output,

(b) directing the beams along chordal lines of the gas turbine engine thereby to traverse substantially a whole crosssection of the engine,

(c) receiving the exiting beams from the engine on respective fluorescent screens to form a fluorescent image thereon,

(d) intensifying the fluorescent imges,

(e) recording said intensified fluorescent images at speeds in excess of 2,500 frames per second by respective high speed recording means, and

(f) applying a common time signature to each of the high

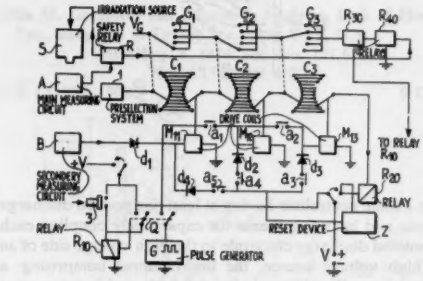
speed recording means for the recording of time signatures along with the recording of each of the intensified fluorescent images to enable a determination of the sequence of events within the gas turbine engine.

4,092,538

DEVICE FOR CHECKING THE IRRADIATION DOSE MEASURING CIRCUITS USED TO MEASURE THE IRRADIATION DOSES DELIVERED BY A RADIOTHERAPY APPARATUS

René Boux, and Claude Levaillant, both of Paris, France, assignors to C.G.R. MeV, Paris, France

Filed Jun. 17, 1976, Ser. No. 696,900
Claims priority, application France, Jun. 20, 1975, 75 19412
Int. Cl.[2] G01T *1/17*; H05G *1/26*
U.S. Cl. 250—336 7 Claims



1. A device for checking the operation of an irradiation dose measuring system, said dose measuring system being provided with a first measuring circuit and a second measuring circuit respectively incorporating a first and a second counter system designed to measure the irradiation delivered by an irradiation source S and control the halting of said irradiation source S when the measured dose level corresponds with a preselected dose level D, said checking device comprising a pulse generator G, first means for applying said pulses to said counter system of at least one of said measuring circuits, second means making it possible to halt said pulse generator G, reset said counter system to zero when coincidence is achieved between a preselected number of pulses corresponding to said preselected dose level D and the counted number of pulses, and means for controlling the halting of operation of the irradiation source S.

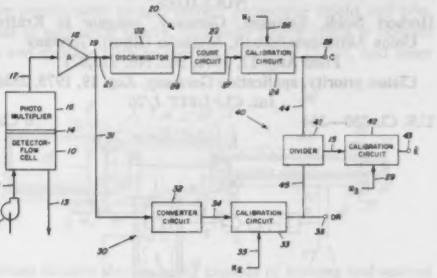
4,092,539

RADIATION MONITOR

Chia Tung Pao, Los Altos, and Walter K. Green, Gilroy, both of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Jul. 23, 1976, Ser. No. 708,281
Int. Cl.[2] G01J *1/00*
U.S. Cl. 250—336 21 Claims

1. A radiation monitoring system comprising: a radiation detection device, including a radiation detector element, responsive to radiation impinging on said element for producing detector output pulses in response to said radiation; pulse counting means connected to said device for receiving said detector output pulses and responsive thereto for converting the received pulses to a current signal and including means for integrating said current signal to



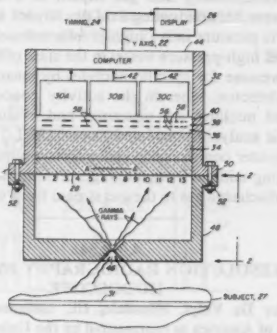
thereby provide an output signal indicative of the integrated energy of said detector output pulses.

4,092,540

RADIOGRAPHIC CAMERA WITH INTERNAL MASK

Harrison H. Barrett, Tucson, Ariz., assignor to Raytheon Company, Lexington, Mass.

Filed Oct. 26, 1976, Ser. No. 735,476
Int. Cl.[2] G01T *1/20*
U.S. Cl. 250—363 S 8 Claims



1. A radiographic camera comprising:

a scintillator positioned for viewing radiation signals from a subject;

a plurality of photodetectors positioned for viewing a common area of said scintillator and providing electrical signals in response to the scintillations from said scintillator;

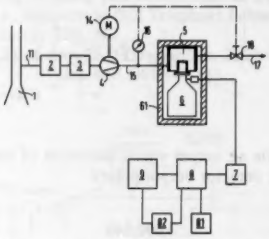
means for masking scintillations of said scintillator, said masking means comprising a pair of masks spaced apart along an axis of said camera, said masking means being positioned between said scintillator and said plurality of photodetectors such that a scintillation of said scintillator casts a shadow of a portion of said masking means upon one of said photodetectors, said masking means having regions relatively opaque to said scintillations located in a predetermined arrangement with regions relatively transparent to said scintillations to provide said shadow with a predetermined format; and

means coupled to said photodetectors for producing an image of said subject from said detector signals, said image producing means including a source of reference signals having a format derived from said shadow format, said image producing means further comprising comparator means for comparing said electrical signals of said photodetectors with said reference signals to produce said image.

4,092,541
METHOD FOR DETERMINING THE ACTIVITY CONCENTRATION IN WASTE GASES FOR SPECIFIC NUCLIDES

Herbert Neidl, Erlangen, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Rhur), Germany

Filed Aug. 12, 1976, Ser. No. 713,871
Claims priority, application Germany, Aug. 19, 1975, 2536897
Int. Cl.² G01T *1/20*
U.S. Cl. 250—364 **6 Claims**

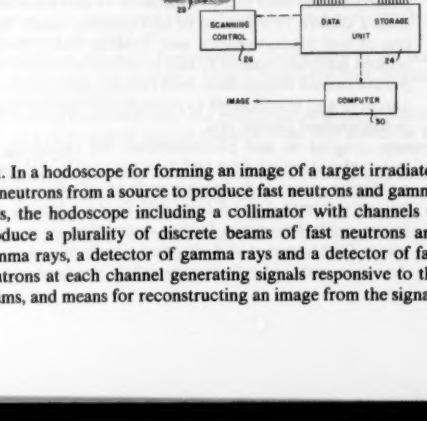


1. In a method for determining the activity concentration of the radionuclides contained in gas stream, particularly in waste gases of nuclear power plants, by means of gamma spectroscopy, the improvement comprising bleeding part of the gas stream, compressing said gas stream to a high superatmospheric pressure, conducting said gas stream at a high superatmospheric pressure into a high-pressure vessel, measuring said gas in said high-pressure vessel in the state of high superatmospheric pressure for specific nuclides by means of a calibrated Ge(Li) detector, wherein the activity concentrations of the individual nuclides are measured and evaluated by a pulse amplitude analyzer connected to said Ge(Li) detector as well as a computer connected to said pulse amplitude analyzer, and discharging said gas from said high-pressure vessel, and returning said discharge gas to the gas stream from which it was bled.

4,092,542
HIGH-RESOLUTION RADIOGRAPHY BY MEANS OF A HODOSCOPE

Alexander De Volpi, Hinsdale, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 27, 1977, Ser. No. 763,436
Int. Cl.² G01T *3/00*; G01N *23/04*
U.S. Cl. 250—392 **6 Claims**



1. In a hodoscope for forming an image of a target irradiated by neutrons from a source to produce fast neutrons and gamma rays, the hodoscope including a collimator with channels to produce a plurality of discrete beams of fast neutrons and gamma rays, a detector of gamma rays and a detector of fast neutrons at each channel generating signals responsive to the beams, and means for reconstructing an image from the signals from the gamma and fast-neutron detectors, the improvement comprising:

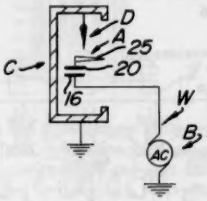
means for scanning the collimator with respect to the target;

control means connected to the scanning means and to the means for reconstructing an image to associate the image with position of the collimator.

4,092,543
ELECTROSTATIC NEUTRALIZER WITH BALANCED ION EMISSION

Warren W. Levy, Cynwyd, Pa., assignor to The Simco Company, Inc., Lansdale, Pa.

Filed Sep. 13, 1976, Ser. No. 722,392
Int. Cl.² H01J *27/00*
U.S. Cl. 250—423 R **10 Claims**

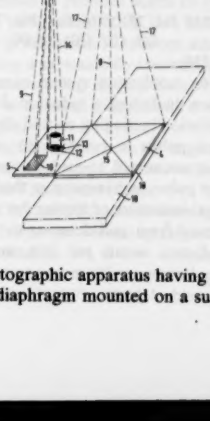


1. In a static neutralizer having at least one pointed discharge electrode and including means for capacitively coupling each such pointed discharge electrode to the high voltage side of an A.C. high voltage source, the improvement comprising: a conductive needle adjacently spaced from and in interacting disposition with at least one such pointed discharge electrode, and means constituting a conductive path connecting each conductive needle to the other side of said A.C. high voltage source so as to enable emission of an equal number of ions of each polarity from the static neutralizer per se.

4,092,544
X-RAY PHOTOGRAPHIC APPARATUS COMPRISING LIGHT SOURCE AND RECEIVING DEVICE ARRANGED TO FACILITATE THE ALIGNMENT OF THE APPARATUS

Stig Grim, Osterskar, Sweden, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 10, 1977, Ser. No. 767,538
Claims priority, application Germany, Mar. 1, 1976, 2608452
Int. Cl.² A61B *6/08*
U.S. Cl. 250—491 **19 Claims**



16. An X-ray photographic apparatus having an X-ray tube with an associated diaphragm mounted on a support for ran-

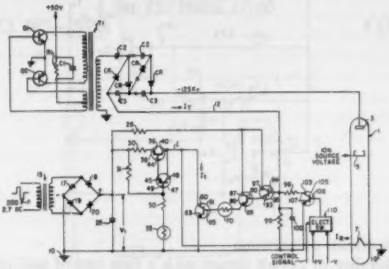
dom movement, a light source rigidly affixed in fixed position relative to a beam eminating from said diaphragm, a cassette assembly including a film holding section and a projection, said projection having a marked field thereon of defined area, a focusing system for said light source for projecting a light beam having a predetermined cross-sectional configuration, said light beam directable at said cassette projection and being able to illuminate said marked field, the edges of the defined light beam being alignable with edges of the marked field such that when aligned, edges of the X-ray beam from the primary diaphragm will be aligned with edges of the film in the film cassette means on said projection indicating when the light beam from said light source is perpendicular to the film cassette, said light beam being parallel to a central ray of said X-ray beam.

4,092,545

MEANS AND METHOD FOR CONTROLLING THE NEUTRON OUTPUT OF A NEUTRON GENERATOR TUBE

Obie M. Langford, and Harold E. Peelman, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Sep. 8, 1976, Ser. No. 721,616
Int. Cl.[2] G21G *4/02*
U.S. Cl. 250—501 **9 Claims**



1. An energizing and regulating circuit for a gas filled neutron generator tube is a nuclear well logging tool having a target, an ion source receiving an ion source voltage and a replenisher connected to ground, comprising power supply means connected to the target in the neutron generator tube for providing a negative high voltage to the target and for providing a target current corresponding to the neutron output of the neutron generator, energy means for providing a constant current, and means connected to the power supply means, to the replenisher in the neutron generator tube and to the energy means for providing a portion of the constant current to the replenisher as a replenisher current in accordance with the target current so as to control the neutron output of the neutron generator tube.

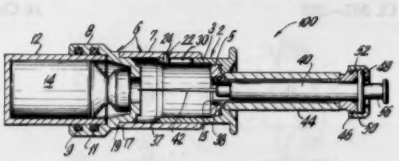
4,092,546

PROTECTIVE SHIELDING ASSEMBLY FOR USE IN LOADING A HYPODERMIC SYRINGE WITH RADIOACTIVE MATERIAL

Edward Whittum Larrabee, Bronxville, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 587,179, Jun. 16, 1975, Pat. No. 3,993,063. This application Jun. 8, 1976, Ser. No. 690,831
Int. Cl.[2] G21C *11/00*
U.S. Cl. 250—515 **6 Claims**

1. A protective shielding assembly, adapted to protect a user from exposure to radiation emitted by a radioactive material, suitable for use in the loading of a hypodermic syringe with said radioactive material, said assembly adapted at one end to be connected to a first protective shield surrounding a vial having a cap and shoulders and at its opposite end adapted to be connected to a second protective shield, surrounding the barrel of said hypodermic syring at the needle end thereof and fixedly holding said hypodermic syringe, said assembly comprising an outer sleeve connectable to said first protective shield and protecting said cap and shoulders of said vial when connected to said first protective shield, an inner protective sleeve connectable to said second protective shield and connected to said outer sleeve, said inner sleeve being in contact with and slidable with respect to said outer sleeve, said inner



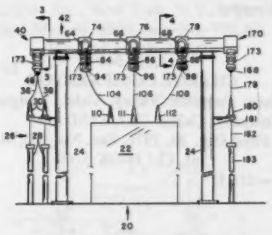
and outer slidable sleeves being capable of moving said second protective shield toward said vial causing penetration thereof by said needle of said hypodermic syringe, wherein said inner sleeve and at least the portion of said outer sleeve protecting said cap and shoulders of said vial are made of a material comprising lead alloy containing at least 85 percent lead by weight.

4,092,547

SWITCH BLOCK

Henry C. Ruppert, Box 1001, 4418 Blackstone Ct., Bloomington, Ind. 47401

Filed Feb. 17, 1976, Ser. No. 658,513
Int. Cl.[2] H02B *13/06*
U.S. Cl. 307—113 **20 Claims**



1. For use with electric utilization means, a prefabricated multiple phase high voltage electric power distribution switch block comprising a first set of external terminals (**44, 46, 48**), a second set of external terminals (**64, 66, 68**), first means (**54, 56, 58**) for coupling terminals of said first set to corresponding terminals of said second set, a third set of external terminals (**94, 96, 98**), a first set of external switches (**84, 86, 88**) for selectively coupling said terminals of said second set to corresponding terminals of said third set, a fourth set of external terminals (**124, 126, 128**), the electric utilization means being coupled to the terminals of the third and fourth sets, a fifth set of external terminals (**144, 146, 148**), a second set of external switches (**134, 136, 138**) for selectively coupling the terminals of said fourth set to corresponding ones of the terminals of said fifth set, a sixth set of external terminals (**164, 166, 168** or **224, 226, 228**), and second means for coupling the terminals of the fifth set to corresponding ones of the terminals of the sixth set, said first coupling means being integrally molded into said switch block.

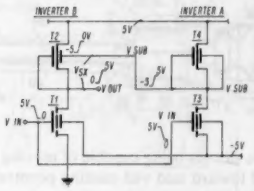
2. A switch block according to claim **1** wherein said second means (**154, 156, 158**) for coupling said terminals (**144, 146, 148**) of said fifth set to corresponding ones of the terminals (**164, 166, 168**) of said sixth set are integrally molded into said switch block.

4,092,548

SUBSTRATE BIAS MODULATION TO IMPROVE MOSFET CIRCUIT PERFORMANCE

Kenneth Edward Beilstein, Jr., and Harish Narandas Kotecha, both of Manassas, Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 15, 1977, Ser. No. 777,793
Int. Cl.[2] H03K *19/40, 3/353;* **H01L** *29/78*
U.S. Cl. 307—205 **16 Claims**



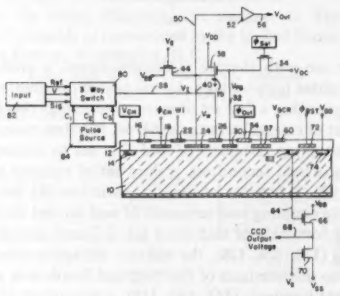
1. An improved FET inverter, comprising:
an active FET device having its gate connected to an input source, its source connected to ground potential and its drain connected to an output node;
an FET load device having an isolated substrate, with its source connected to said output node and its drain connected to a drain potential;
a modulating signal source connected to said isolated substrate, which increases the isolated substrate's potential at a greater rate than the output potential at said output node increases;
whereby the load device threshold voltage is reduced as the output voltage at said output node increases from its initial value, thereby improving the load curve characteristics for the inverter.

4,092,549

CHARGE COMPARATOR

Paul R. Prince, Fountain Valley, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 20, 1976, Ser. No. 752,703
Int. Cl.[2] H03K *5/00*
U.S. Cl. 307—221 D **16 Claims**



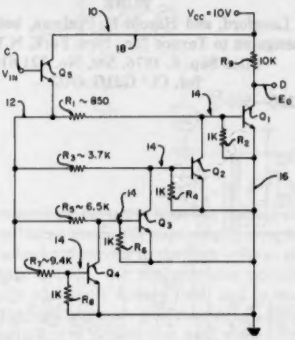
1. An arrangement for comparing an input signal from a source with a reference signal comprising:
a CTD channel,
a first electrode in said CTD channel,
a second electrode in said channel sequentially positioned along said channel from said first electrode and coupled to said source,
a third electrode in said channel sequentially positioned along said channel from said second electrode,
voltage buffering means coupling said third electrode to said first electrode,
a source of clamping potential coupled to said third electrode through a switch,
whereby said CTD channel and said first and second electrodes create a charge bucket with charges therein and with a barrier formed by said second electrode responding to said reference signal, said second electrode responding to an input signal to change the barrier so as to provide positive feedback if said barrier is lowered, to transfer some charges over said barrier, said charge bucket thereby emptying over said barrier.

4,092,550

FREQUENCY MULTIPLIER AND LEVEL DETECTOR

Donald K. Lauffer, Poway, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Nov. 22, 1976, Ser. No. 744,204
Int. Cl.[2] H03K *3/78, 3/26;* **H03B** *19/14;* **H03K** *17/30*
U.S. Cl. 307—229 **17 Claims**



1. A circuit comprising:
a plurality of circuit means with a first one of said circuit means and the remaining one or ones thereof being interconnected in successive stages, with each said circuit means being capable of assuming first and second states in response to predetermined values of an input pulse;
means for supplying an input pulse to each of said circuit means; and
means interconnecting said plurality of circuit means for producing a number of output pulses at said first one of said circuit means, which said number of output pulses is dependent upon the number of said plurality of circuit means which have assumed said first state in response to said input pulse whereby said interconnecting means enable the second or any subsequent one of said circuit means, when assuming said first state, to cause the preceding said circuit means to assume said second state.

4,092,551

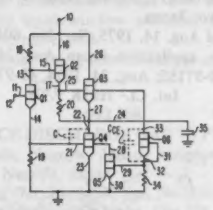
A.C. POWERED SPEED UP CIRCUIT

Donald Dunbar Howard, Underhill Center, Vt., and Helmut Schettler, Boeblingen, Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 20, 1976, Ser. No. 688,220
Int. Cl.[2] H03K *17/00*
U.S. Cl. 307—254 **7 Claims**

1. A circuit comprising:
a pull up transistor having an emitter coupled to an output and a base,
a pull down transistor having a base, an emitter and a collector, whose emitter is coupled to a reference potential and whose collector is coupled to said output, and
a speed up circuit comprising a capacitor and a switching means coupled between said reference potential and the base of the pull down transistor for bringing down the

base of the pull down transistor to said reference potential to render the pull down transistor nonconductive,



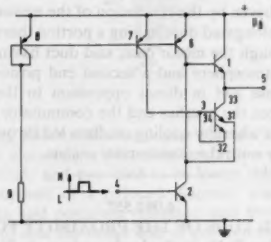
said switching means having a control electrode connected through said capacitor to the base of said pull up transistor.

4,092,552

BIPOLAR MONOLITHIC INTEGRATED PUSH-PULL POWER STAGE FOR DIGITAL SIGNALS

Wolfgang Hoehn, Keltenring, Germany, assignor to ITT Industries, Incorporated, New York, N.Y.

Filed May 23, 1977, Ser. No. 799,416
Int. Cl.² H03K *17/60*
U.S. Cl. 307—299 A **5 Claims**



1. A bipolor monolithic integrated push-pull power output stage for digital signals, comprising:

a first transistor having a base, emitter and collector, said collector for receiving a source of supply voltage;

a second transistor having a base, emitter and collector, said emitter for coupling to the zero point of the circuit and said base forming an input;

a double emitter transistor having first and second emitters, a base and a collector, said collector coupled to the emitter of said first transistor and forming an output, said first emitter coupled to the collector of said second transistor and to the base of said first transistor, and said second emitter coupled to the base of said double emitter transistor, the emitter base junction area of said second emitter being at least two times greater than that of said first emitter; and

means for applying a potential to the base of said first transistor and to the base of said double emitter transistor.

4,092,553

JOSEPHSON LOGIC CIRCUIT POWERING ARRANGEMENT

Frank Fu Fang, Yorktown Heights, and Dennis James Herrell, Somers, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

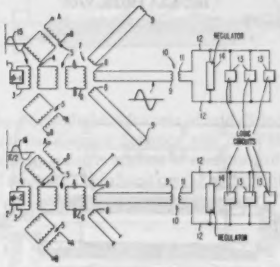
Filed Feb. 26, 1976, Ser. No. 661,600
Int. Cl.² H03K *3/38, 19/195*
U.S. Cl. 307—306 **15 Claims**

1. A logic circuit powering arrangement comprising:

a at least a single chip,

at least a single logic circuit including a bilateral switchable device capable of carrying Josephson current disposed on said at least a single chip,

alternating current means connected to said logic circuit for applying alternating current to said switchable device the amplitude of which is insufficient to switch said switchable device,



means electrically connected to said switchable device for controlling the switching thereof, and,

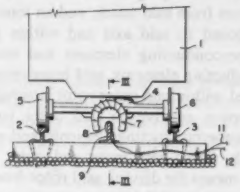
regulating means disposed on said at least a single chip in parallel with said alternating current means.

4,092,554

LINEAR ELECTRIC GENERATING SYSTEM

James M. Quinn, Hillsburgh, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed May 19, 1977, Ser. No. 798,401
Int. Cl.² H02K *35/00*
U.S. Cl. 310—13 **1 Claim**



1. A linear electric generating system powered by a railroad vehicle moving along a railroad track, said railroad vehicle having an undercarriage and wheels, said wheels rolling along the rails of the railroad track and said undercarriage being spaced above said rails and the area between said rails, said linear electric generating system comprising

magnet means mounted on the undercarriage of the railroad vehicle and producing a magnetic field;

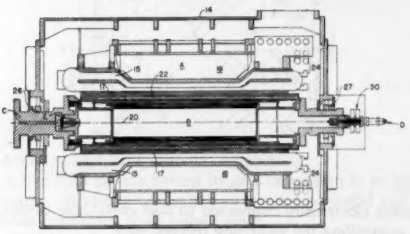
coil means mounted between the rails and extending in the same direction as said rails, said coil means being positioned in the magnetic field generated by the magnet means whereby as the magnetic field moves along said coil means, said magnetic field produces electrical energy in said coil means, said coil means comprising a third rail of electrically non-conductive material equidistantly spaced between and substantially parallel to the rails of the railroad track, said third rail being electrically insulated from ground, and an electrically conductive coil wound on said third rail; and

output conductive means electrically connected to the coil means for deriving the electrical energy produced in said coil means.

4,092,555
SLIDING SUPPORT FOR A SUPERCONDUCTING GENERATOR ROTOR

Sui-Chun Ying, Monroeville, and Glen D. Cooper, North Huntington Township, Huntington County, both of Pa., assignors to Electric Power Research Institute, Palo Alto, Calif.

Filed Oct. 15, 1976, Ser. No. 732,561
Int. Cl.[2] H02K 9/00
U.S. Cl. 310—52 12 Claims

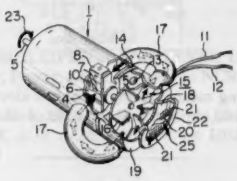


1. In a generator including in combination a stator and a rotor; a stub shaft of a generator power train connected to a source of rotational power, said shaft rotating about an axis to provide powered rotation of said rotor with respect to said stator to generate electricity in windings disposed in said stator; a superconducting rotor including an outer rotor structure coaxial with an axis including means for damping electromotive forces from said stator to said rotor and means for supporting said means for damping electromotive forces against electromotive forces from said stator, and an inner rotor structure coaxially disposed to said axis and within said outer rotor including superconducting elements and means for cooling said superconducting elements, said inner rotor structure thermally insulated within said outer rotor structure and subject to thermal excursion relative to said outer rotor during cool down of said superconducting elements; and, means for axially and torsionally fixing said inner and outer rotor structures together, and means for driving said rotor from said stub shaft, the improvement in said driving means comprising: a coupling extending between said inner rotor structure and said stub shaft, said coupling providing for longitudinal excursion and torsional rigidity between first and second ends of said coupling; said coupling including a flexible diaphragm member attached to a first end of said coupling; a plurality of axially disposed fingers defining contacting surfaces parallel to said axis integrally attached to said flexible diaphragm member, said fingers providing a rigid torsional connection to said diaphragm and extending axially of said rotating structures from the first end of said coupling toward the second end of said coupling; a member defining a corresponding plurality of spline receiving, axially extending slots for receiving fingers of said diaphragm attached to the second end of said coupling; means biasing said fingers relative to said axis with a force into said slots; said biasing fingers received within said finger-receiving slots to slide with excursion of one of said rotating structures with respect to the other rotating structure and to remain in nonslipping contact across said coupling during rotation of said rotating structures with deflection of said inner rotating structure whereby non-axial loading forces of said inner rotating structure are elastically received at said flexible diaphragm during rotation of said inner and outer rotating structures.

4,092,556
FORCED COOLED ELECTRIC MOTOR

Kenichi Mabuchi, Tokyo, Japan, assignor to Mabuchi Motor Co., Ltd., Tokyo, Japan

Filed Aug. 14, 1975, Ser. No. 604,891
Claims priority, application Japan, Aug. 24, 1974, 49-97154; Aug. 24, 1974, 49-97155; Aug. 24, 1974, 49-97156
Int. Cl.[2] H02K 9/08
U.S. Cl. 310—57 16 Claims

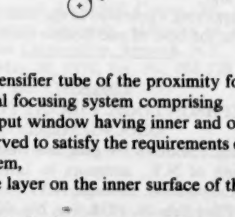


1. A forced cooled electric motor having a stator comprising permanent magnets, said stator being secured to the motor case, a rotor having rotor coils, said rotor being rotatable relative to said stator, a commutator means for controlling supply of current to said stator or rotor, said motor case enclosing said stator, said rotor and said commutator means having at least one outlet that is spaced from said commutator means, a fan driven by the revolution of the motor and at least one external, elongated duct having a portion thereof arranged to extend through the motor case, said duct having a first end open to the atmosphere and a second end positioned within said motor case and in direct opposition to the surface of contact between the brushes and the commutator of the commutator means whereby cooling medium led through said duct blows directly onto the commutator means.

4,092,557
INTENSIFIER TUBE OF THE PROXIMITY FOCUS TYPE

Hendrik Mulder, Delft, Netherlands, assignor to N. V. Optische Industrie "De Oude Delft", Delft, Netherlands

Filed Jul. 12, 1976, Ser. No. 704,529
Claims priority, application Netherlands, Jul. 23, 1975, 7508791
Int. Cl.[2] H01J 39/00, 39/02
U.S. Cl. 313—102 1 Claim



1. An image intensifier tube of the proximity focus type for use with an optical focusing system comprising

a transparent input window having inner and outer surfaces which are curved to satisfy the requirements of the optical focusing system,

a photosensitive layer on the inner surface of the input window

a fiber optic plate having one a convex surface uniformly disposed about 1 millimeter from the inner surface of the input window,

a phosphor layer on said convex surface of the fiber optic plate, said input window and said photosensitive layer

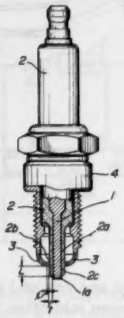
thereon being concave and of substantially the same curvature as said convex surface,
the other surface of the fiber optic plate being planar,
means forming an enclosed space between said concave surface of the input window and said convex surface of the fiber optic plate, and
said enclosed space being substantially evacuated.

4,092,558

LONG DISTANCE DISCHARGE GAP TYPE SPARK PLUG

Shigeyasu Yamada, Nagoya, Japan, assignor to NGK Spark Plug Co. Ltd., Nagoya, Japan

Filed Oct. 11, 1977, Ser. No. 841,070
Claims priority, application Japan, Oct. 19, 1976, 51-125160
Int. Cl.[2] H01T *13/32, 13/52*
U.S. Cl. 313—131 R **3 Claims**



1. In a long distance discharge gap type spark plug comprising a center electrode, a porcelain insulator surrounding said center electrode and provided at its lower side with a firing portion composed of a reduced diameter trunk wall made integral with said porcelain insulator, said firing portion extending up to near the lower end of said center electrode and exposing said lower end, and a grounded electrode opposed through said trunk wall to said center electrode, the improvement comprising a surface gap L formed between the front end of said center electrode and said grounded electrode and given by

$1.0 \text{ mm} \leqq L \leqq 4.5 \text{ mm}$,

a minor air gap l formed between the outer peripheral surface of said firing portion and said grounded electrode and given by

$0 \leqq l \leqq 0.6$ mm, and

a thickness t of the trunk wall of said firing portion given by

$0.5 \text{ mm} \leqq t \leqq 0.9$ mm,

said surface gap L being determined within a range that satisfies the following conditions, i.e.

$L \leqq 5t + 2.0$ mm when $0.4 \text{ mm} < l \leqq 0.6$ mm,
$L \leqq 5t$ when $0.2 \text{ mm} < l \leqq 0.4$ mm,
$L \leqq 5t - 1.5$ mm when $0 < l \leqq 0.2$ mm, and
$L \leqq 5t - 2.5$ mm when $l = 0$.

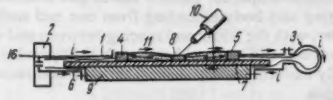
4,092,559

CONTROLLED DISCHARGER

Pavel Nikanorovich Dashuk, Svetlanovaky prospekt 39, kv. 45, Leningrad, U.S.S.R.

Continuation of Ser. No. 588,961, Jun. 20, 1975, abandoned. This application Sep. 9, 1976, Ser. No. 722,051
Int. Cl.[2] H01J *17/00*
U.S. Cl. 313—192 **8 Claims**

1. A controlled discharger comprising direct and reverse current buses; two main electrodes electrically coupled to a load and a power source with the aid of said direct and reverse current buses; a control electrode arranged between said main electrodes; an initiating pulse channel having one of its poles electrically connected to said control electrode; a dielectric element having said main electrodes and said control electrode mounted on one of its sides, its opposite side being provided, at the portion corresponding to the gap between the main electrodes, with a current-conducting layer electrically connected to at least one of said main electrodes and the other pole of said



initiating pulse channel, the thickness of said dielectric element being less than the distance between said main electrodes, so that as an initiating pulse is applied to said control electrode, a multichannel discharge is formed on the surface of said dielectric element.

4,092,560

VAPOR DISCHARGE LAMP CERMET ELECTRODE-CLOSURE AND METHOD OF MAKING

Ferenc Puskaś, Budapest, Hungary, assignor to Chemokomplex Vegyipari Gepes Berendezes Export-Import Vallalat, Budapest, Hungary

Filed Jan. 13, 1975, Ser. No. 540,714
Claims priority, application Hungary, Jan. 15, 1974, PU 189
Int. Cl.[2] H01J *1/88, 19/42*
U.S. Cl. 313—244 **9 Claims**

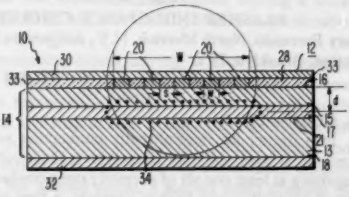
1. An end electrode closure for high pressure vapor discharge lamps, which comprises a shaped, sintered, electrically conductive cermet body made from an electrode metal component and a metal oxide ceramic component as ingredients, said body including an integral shaped part as an electrode.

4,092,561

STRIPE CONTACT PROVIDING A UNIFORM CURRENT DENSITY

Harry Francis Lockwood, New York, N.Y., and Henry Kressel, Elizabeth, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Sep. 22, 1975, Ser. No. 615,682
Int. Cl.[2] H01J *1/62*
U.S. Cl. 313—499 **6 Claims**



1. An electroluminescent semiconductor device comprising:

a body of semiconductor material having opposed parallel end surfaces, opposed side surfaces, a pair of spaced contacting surfaces substantially perpendicular to said end surfaces, and a recombination region in which radiation can be generated; and

a stripe contact at one of said contacting surfaces having a plurality of spaced, parallel sub-stripes individually contacting said body extending from one end surface to the other, with the width and spacing between said sub-stripes along said end surfaces being such as to provide a substantially uniform current density through said recombination region.

4,092,562

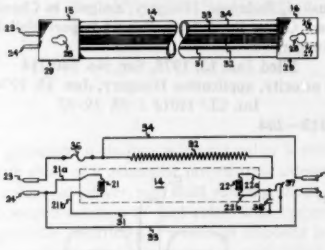
FLUORESCENT LAMP UNIT FOR MULTIPLE INSTALLATION

John H. Campbell, Mentor, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 599,521, Jul. 28,1975, abandoned. This application May 7, 1976, Ser. No. 684,072

Int. Cl.[2] H05B *41/16*

U.S. Cl. 315—189 **23 Claims**



1. An integral lamp unit comprising an elongated gas discharge lamp containing first and second electrodes therein respectively near first and second ends thereof, an input power connector attached to said first end of the lamp and provided with first and second input power terminals, an output power connector attached to said second end of the lamp and provided with first and second output power terminals, a first elongated power conductor positioned alongside and adjacent to said lamp and connected electrically between said first input power terminal and said first output power terminal, a second elongated power conductor positioned alongside and adjacent to said lamp and connected electrically between said second input power terminal and said second output power terminal, ballast means connected electrically between said first input power terminal and said second electrode, and means electrically connecting said second input power terminal to said first electrode, said terminals of the input power connector being adapted to mate with the terminals of an output power connector of another similar lamp unit and said terminals of the output power connector being adapted to mate with the terminals of an input power connector of another similar lamp unit.

4,092,563

FLASHER INDUCTANCE CIRCUIT

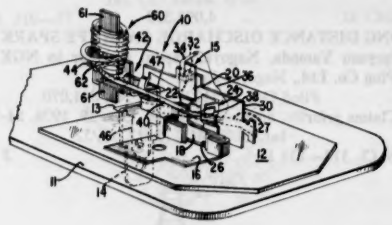
Henry Parrondo, North Merrick, N.Y., assignor to Ideal Corporation, Brooklyn, N.Y.

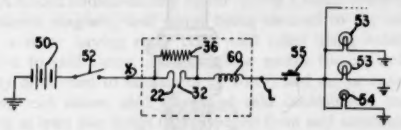
Filed Aug. 30, 1976, Ser. No. 718,566

Int. Cl.[2] B60Q *1/34*

U.S. Cl. 315—200 A **11 Claims**

1. In a flasher for intermittently connecting vehicle signal lamps and at least one pilot lamp with a D.C. voltage source, comprising at least one set of normally open contacts including a set of normally open flasher contacts, a first terminal connected with one of said flasher contacts for connecting it with said source, a junction connected with the other of said flasher contacts, at least one output terminal for connection with said signal and pilot lamps, each said set of contacts having means connected therewith for closing the contacts thereof in response to a flow of current between said first terminal and said at least one output terminal, and means responsive to closing of said flasher contacts for opening them to discontinue current flow to said at least one output terminal, the improvement which comprises means, including a conductor extending





between said junction and one said output terminal, for conducting current between said other flasher contact and each said output terminal, said conductor having a length thereof in series with each said set of contacts, said length being coiled so as to produce an inductance effective to inhibit deterioration of the contacts of each said set by sparking as said contacts of each said set are closed.

4,092,564

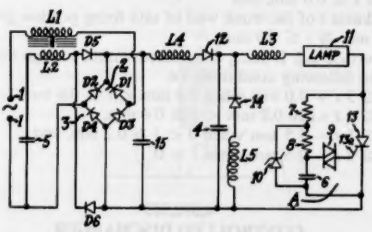
DISCHARGE LAMP OPERATING CIRCUIT

Trasimond A. Soileau, Flat Rock, N.C., assignor to General Electric Company, New York, N.Y.

Continuation-in-part of Ser. No. 692,080, Jun. 2, 1976, Pat. No. 4,069,442. This application Dec. 15, 1976, Ser. No. 750,749

Int. Cl.[2] H05B *41/231*

U.S. Cl. 315—208 **15 Claims**



1. A lamp operating circuit comprising, in combination, a DC power source, a charging capacitor, a first inductor in series with said charging capacitor connected across said DC power source and forming therewith a charging circuit for charging said capacitor, a second inductor connected across said charging capacitor and forming therewith a discharging circuit for discharging said capacitor, a controlled switch in series with one of said inductors, said one inductor having a substantially smaller inductance than the other inductor, control means coupled to said controlled switch for repetitively operating the same at predetermined intervals, means for con-

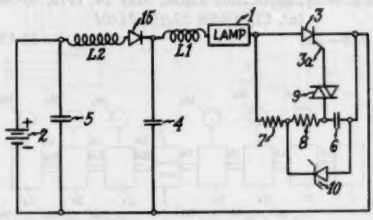
necting a gaseous discharge lame in series in one of said charging and discharging circuits, and unidirectional circuit means comprising a unidirectional conductor and a third inductor in series therewith connected across said serially connected one inductor and controlled switch for limiting the voltage across controlled switch and for controlling lamp wattage with respect to changes in lamp voltage.

4,092,565

PULSE CIRCUIT FOR GASEOUS DISCHARGE LAMPS

Wayne R. Neal, Hendersonville, N.C., assignor to General Electric Company, New York, N.Y.

Filed Nov. 22, 1976, Ser. No. 743,566
Int. Cl.[2] H05B *41/231, 41/30*
U.S. Cl. 315—283 **15 Claims**



1. A lamp operating circuit comprising, in combination, a direct current power source, a first inductor and a capacitor in series with each other across said power source, a second inductor and unidirectional controlled switch means connected in series across said capacitor, said second inductor having a lower inductance than said first inductor, means for connecting a lamp in series with said second inductor and said controlled switch means, and control means connected to said unidirectional controlled switch means for intermittently turning on the same at predetermined intervals, the ratio of the inductance of said first inductor to the inductance of said second inductor being sufficiently high to provide for commutation of said unidirectional controlled switch means, whereby pulses may be applied to a lamp connected to said lamp connecting means for operation thereof.

4,092,566

SWITCHED HIGH VOLTAGE POWER SUPPLY SYSTEM

Derek Chambers, Bedford, N.H., and Hugh C. Masterman, Littleton, Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 573,710, May 1, 1975, abandoned. This application Jan. 13, 1977, Ser. No. 758,974
Int. Cl.[2] H01J *29/80*
U.S. Cl. 315—375 **27 Claims**

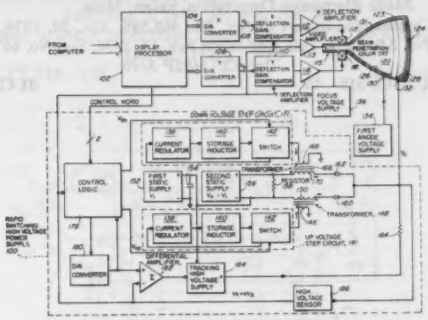
1. In combination:

a beam penetration cathode-ray tube having an accelerating and a screen electrode;

at least one inductor;

means for maintaining a DC idling current through said inductor while a constant voltage is applied to said screen electrode; and

means for selectively coupling said inductor to said screen electrode in response to a signal for determining which of three or more colors of light is to be emitted from said cathode-ray tube, said coupling means comprising switching means operating to couple said inductor to said screen electrode upon a change in said signal and operating to uncouple said inductor from said screen electrode when the voltage applied to said screen electrode is at a value causing the color of light indicated by said signal to be emitted from said cathode-ray tube, the major portion of



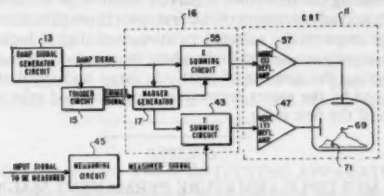
the energy required to vary said voltage applied to said screen electrode being from said inductor.

4,092,567

METHOD AND CIRCUIT FOR GENERATING DIAMOND MARKERS

David D. Sharrit, Santa Rosa, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 17, 1976, Ser. No. 667,778
Int. Cl.[2] G01R *13/30*
U.S. Cl. 315—377 **15 Claims**



1. In a system having an X input and a Y input for displaying on coordinate axes a composite waveform of first and second signals applied to the system, a display marker circuit for generating a symbol marking a spot on the displayed waveform in response to an applied trigger signal, the display marker circuit comprising:

a marker generator coupled to receive the trigger signal and the second signal for producing first and second marker signals representing phased vector components of the marker symbol along the coordinate axes respectively, said first and second marker signals having a duration proportional to and substantially less than the duration of said second signal;

a first summation means having a first input coupled to receive the first signal, a second input coupled to receive the first marker signal and an output coupled to the Y input for applying to said Y input the algebraic combination of the first signal and the first marker signal; and

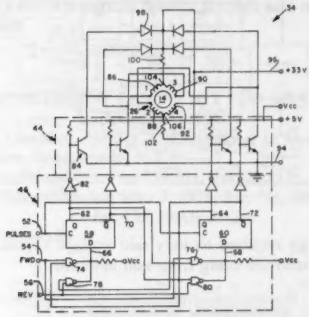
a second summation means having a first input coupled to receive the second signal, a second input coupled to receive the second marker signal and an output coupled to the X input for applying to said X input the algebraic combination of the second signal and the second marker signal.

4,092,568

INTERPOLATING STEPPING MOTOR SYSTEM

Harold R. Newell, South Newbury, N.H., assignor to Mesur-Matic Electronics Corporation, Salem, Mass.

Continuation-in-part of Ser. No. 465,596, Apr. 30, 1974, Pat. No. 3,961,232. This application Feb. 13, 1976, Ser. No. 657,989
Int. Cl.[2] H02P *5/46*
U.S. Cl. 318—46 **31 Claims**



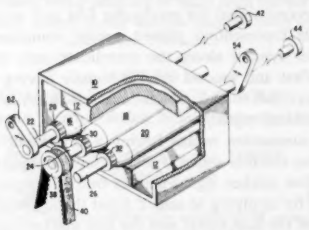
1. In combination with a first step motor having a rotor advanced through a relatively large step per unit of time toward a selected position and a plurality of phase windings energized in accordance with a predetermined switching format to effect unlimited stepped advancement of the rotor, interpolating means for advancing said rotor a distance equal to or less than one of said large steps, comprising a second step motor having a second rotor advanced a predetermined number of steps and a plurality of phase windings energized to effect said stepped advancement of the second rotor, means drivingly connecting the second rotor to the first motor for advancing the first rotor relatively small steps simultaneously with said advancement of the first rotor through said relatively large steps to the selected position, and digital logic means operatively connected to the phase windings of the motors for selecting the number of relatively large and small steps advanced by the rotors respectively to reach said selected position of the first rotor.

4,092,569

MULTIPLE ARMATURE PERMANENT MAGNET MOTOR/ACTUATORS

John Addison Herr, Garwood, and Wolfgang Jaffe, Roselle Park, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Sep. 7, 1976, Ser. No. 721,144
Int. Cl.[2] H02K *1/04*
U.S. Cl. 318—35 **8 Claims**



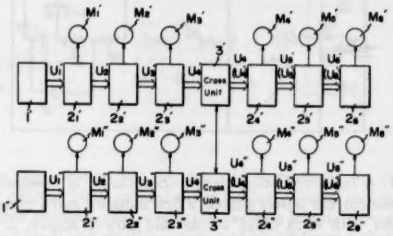
1. An electric motor having a frame of magnetic material, said frame including opposed top and bottom walls, permanent magnet means secured to the inner peripheral surface of said walls in opposing polar relationship and defining a single air gap therebetween, and a plurality of solid non-magnetic armatures disposed within said single air gap and within the confines of said opposed top and bottom walls.

4,092,570

SEQUENTIAL CONTROL DEVICE

Yutaka Nakamoto, 1556-31, Oaza-Kasuga, Kasuga-shi, Fukuoka, Japan

Filed Feb. 19, 1976, Ser. No. 659,191
Claims priority, application Japan, May 14, 1975, 50-58249
Int. Cl.[2] G05B *22/02, 11/01*
U.S. Cl. 318—102 **11 Claims**



1. A sequential control device for a number of electric actuating devices such as motors or the like disposed in sequence in at least two manufacturing lines comprising

(1) master control units (1′) and (1″) for transmitting control signals ($U_{1'}$) and ($U_{1''}$) respectively,

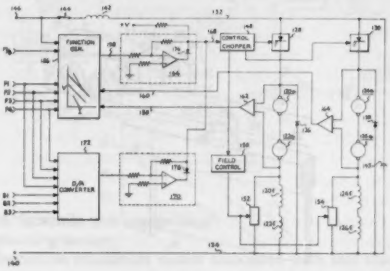
(2) drive units ($2_{1'}$, $2_{2'}$ - - - $2_{r'}$ - - - $2_{n'}$ and $2_{1''}$, $2_{2''}$ - - - $2_{r''}$ - - - $2_{n''}$) for controlling the operation of the same number of said electric actuating devices ($M_{1'}$, $M_{2'}$ - - - $M_{r'}$ - - - $M_{n'}$ and $M_{1''}$, $M_{2''}$ - - - $M_{r''}$ - - - $M_{n''}$), each of said drive units comprising circuit means for controlling the corresponding electric actuating device, and

(3) cross units (3′) and (3″) disposed between said first drive units ($2_{r'}$) and ($2_{r'+1}$) and said second drive units ($2_{r''}$) and $2_{r''+1}$) respectively, for changing the manufacturing route, wherein said sequential control signals ($U_{1'}$) and ($U_{1''}$) are transmitted to a head drive unit ($2_{1'}$) and ($2_{1''}$) and then the operation conditions ($V_{1'}$) and ($V_{1''}$) for controlling said actuating devices ($M_{1'}$) and ($M_{1''}$) are transmitted to said corresponding drive units ($2_{1'}$) and ($2_{1''}$) and after the sequential control signals ($U_{2'}$) and ($U_{2''}$) are transmitted to one-step forward units ($2_{2'}$) and ($2_{2''}$) and in this way such sequential control signals ($U_{3'}$, $U_{4'}$ - - - $U_{r'}$ - - - $U_{n'}$ and $U_{3''}$, $U_{4''}$ - - - $U_{r''}$ - - - $U_{n''}$) are transmitted in sequence to respective drive units ($2_{3'}$, $2_{4'}$ - - - $2_{r'}$ - - - $2_{n'}$ and $2_{3''}$, $2_{4''}$ - - - $2_{r''}$ - - - $2_{n''}$) while said operation conditions ($V_{3'}$, $V_{4'}$ - - - $V_{r'}$ - - - $V_{n'}$ and $V_{3''}$, $V_{4''}$ - - - $V_{r''}$ - - - $V_{n''}$) are transmitted to said respective drive units ($2_{3'}$, $2_{4'}$ - - - $2_{r'}$ - - - $2_{n'}$ and $2_{3''}$, $2_{4''}$ - - - $2_{r''}$ - - - $2_{n''}$) following said transmission of respective sequential signals ($U_{3'}$, $U_{4'}$ - - - $U_{r'}$ - - - $U_{n'}$ and $U_{3''}$, $U_{4''}$ - - - $U_{r''}$ - - - $U_{n''}$), and by the activation of cross units 3′ and 3″ said sequential control signals are transmitted through said drive units in the following sequences such as ($2_1 \rightarrow 2_2 \rightarrow 2_{r'}$ $2_{r'}+1$ - - - $2_{n'}$) or $2_{1''} \rightarrow 2_{2''} \rightarrow 2_{r'} - 2_{r'}+1 \rightarrow 2_{n'}$), whereby several processing or manufacturing routes can be made by the application of said sequential control device cross units (3′) and (3″).

4,092,571
POWER MATCHING SYSTEM FOR A TRAIN OF INDIVIDUALLY POWERED TRANSIT VEHICLES

Robert John Hopkins; Thomas Detlor Stitt, and Hillert Vitt, all of Erie, Pa., assignors to General Electric Company, Erie, Pa.

Filed Nov. 9, 1976, Ser. No. 740,333
Int. Cl.[2] H02P 1/56
U.S. Cl. 318—106 6 Claims



1. In a self-propelled traction vehicle adapted to be operated in a train with other self-propelled vehicles, all of said vehicles including electrically powered propulsion means and control means therefor, the propulsion means comprising electric traction motors connected in driving relationship to wheels of the associated vehicle and power conditioning means adapted for receiving electric power from a power source for energizing said traction motors, said control means being responsive to a plurality of trainline signals supplied from a train operator to each of the vehicles for controlling the associated power conditioning means so as to regulate the tractive effort developed by the traction motors, the power conditioning means of said traction vehicle being of a first type and the power conditioning means of at least one of said other vehicles being of a different type, the improvement comprising:

a. a programmed power matching circuit operatively connected in circuit with the control for the first type power conditioning means of said traction vehicle, said power matching circuit being programmed to produce an output signal that varies as a selected one of an assortment of predetermined functions of a variable input signal, said functions respectively approximating the voltage-current relationships that characterize the traction motors energized by said different type power conditioning means of said at least one other vehicle under various operating conditions determined by said trainline signals;

b. means for supplying as the input signal to said power matching circuit a signal representative of the magnitude of voltage energizing an armature of a traction motor of said traction vehicle;

c. said power matching circuit including means responsive to said trainline signals for selecting whichever one of said assortment of predetermined functions corresponds to the particular operating condition called for by said trainline signals;

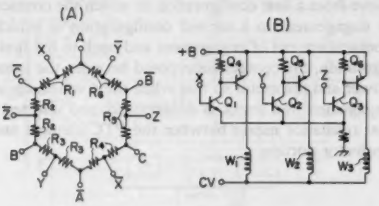
d. means for supplying said output signal from said power matching circuit to the control means for said first type power conditioning means; and

e. said control means being arranged to control the power conditioning means of said traction motor in response to said output signal so as to regulate traction motor current.

4,092,572
BRUSHLESS D.C. MOTOR DRIVING SYSTEM

Motomu Murata, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 2, 1976, Ser. No. 719,784
Claims priority, application Japan, Sep. 4, 1975, 50-107382
Int. Cl.[2] H02K 29/00
U.S. Cl. 318—138 4 Claims



1. In a brushlesss direct current motor including a permanent magnet rotor having a plurality of poles, an electromagnet stator having a plurality of poles unequal to the number of rotor poles, and a plurality of angular rotor position sensing means spaced around the periphery of the stator and producing overlapping, phase displaced, rectangular waveforms, and reciprocal waveforms thereof, each waveform having an on-time duration or flow angle of 180 electrical ° with respect to the rotor, an improved stator winding drive circuit comprising:

(a) a resistive addition network responsive to the sensing means waveforms for producing a plurality of staircase signals, the upper portions of which have sequential, consecutive, non-overlapping flow angles,

(b) a plurality of stator windings, and

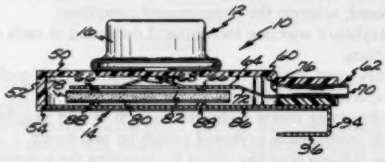
(c) a threshold switching circuit responsive to the staircase signals and conductive only during the upper portions thereof for supplying the stator windings with sequential, consecutive, non-overlapping drive currents, whereby the motor efficiency is improved and torque ripple is reduced,

wherein the addition network comprises a plurality of series connected, equal valued resistor pairs, two sensing means waveforms are coupled to the ends of each pair, and a staircase signal is taken from the junction of each pair.

4,092,573
MOTOR STARTING AND PROTECTING APPARATUS

John R. D'Entremont, Foxboro Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 642,858, Dec. 22, 1975, abandoned. This application Jul. 29, 1976, Ser. No. 709,673
Int. Cl.[2] H02H 7/08
U.S. Cl. 318—221 C 15 Claims



1. A combination motor starter and protector apparatus comprising:

a starter portion including a housing,

terminal means mounted in the housing for connecting a motor starter and protector apparatus to a motor and a source of power,

an element composed of positive temperature coefficient (PTC) of resistivity material disposed in the housing,

electrical lead means connecting the element to the terminal means,

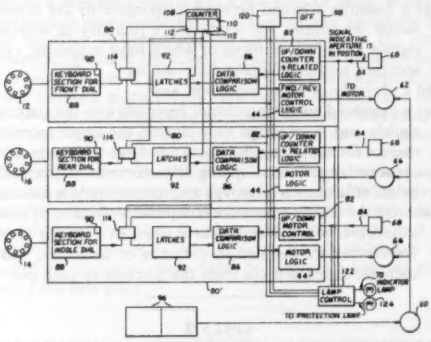
a protector portion including first and second electrical contacts disposed in the housing electrically connected to the terminal means, the contacts movable relative to one another into and out of engagement, a thermostatic member disposed in the housing and operatively connected to the set of contacts, the thermostatic member adapted to move from a first configuration in which the contacts are in engagement to a second configuration in which the contacts are out of engagement and back to the first configuration, the contacts interposed between the source of power and the motor so that when the contacts are out of engagement the motor is deenergized, and selected thermal resistance means between the PTC element and the protector portion.

4,092,574

AUTOMATIC REMOTE CONTROLLED OPTHALMIC REFRACTING CHART PROJECTOR

Donald H. Hansen, and Morey H. Waltuck, both of Williamsville, N.Y., assignors to American Optical Corporation, Southbridge, Mass.

Filed Dec. 8, 1976, Ser. No. 748,601
Int. Cl.[2] G05B *11/14*
U.S. Cl. 318—265 **3 Claims**



1. In a slide projector having a plurality of rotatable coaxial discs, each defining a plurality of slide apertures disposed peripherally therearound and positionable one at a time in the optical axis of said projector, each of said discs being interconnected to a driving motor for rotation of said discs, and control means to effect motor operation in continuous and incremental modes of rotation in response to slide selection at a master keyboard, wherein the improvement comprises:

a keyboard selection switchboard dedicated to each of said discs,

a keyboard switch on said board dedicated to each slide aperture on said disc,

multiplexing means dedicated to each of said switchboards to sample each keyboard switch on said board,

free running counting means for sampling the actuated state of said switches,

latching circuit means connected to said multiplexing means for recording actuation of said switches,

counting means interconnected to said discs for recording the relative position of each of said discs,

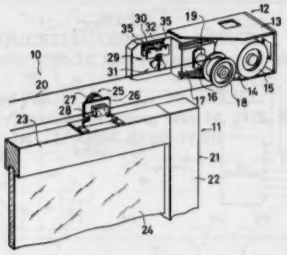
comparison means for comparing the output of said latch circuit means and said disc counting means, said comparison means being interconnected to said driving motor whereby said motor is operated in response to the output of said comparison means.

4,092,575

APPARATUS FOR AUTOMATICALLY CONTROLLING THE OPERATION OF AUTOMATIC DOOR

Masaaki Ogishi, Kurobe, and Akira Azuma, Uozu, both of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Aug. 30, 1976, Ser. No. 718,820
Claims priority, application Japan, Sep. 8, 1975, 50-108683; Sep. 8, 1975, 50-108684; Sep. 8, 1975, 50-108685
Int. Cl.[2] G05D *3/00*
U.S. Cl. 318—282 **14 Claims**



1. Apparatus for automatically controlling the operation of a reciprocable door between its closed and opened positions comprising:

(a) an electric reversible motor connectable to a power source;

(b) a speed reducer operatively associated with said motor, said speed reducer having means for being operatively engaged to the door to drive the same;

(c) means for generating a driving signal;

(d) means for sensing the position of the door during its opening and closing strokes to generate a sensing signal, comprising:

(1) an actuator unit including

(i) a drive shaft coupled to an output shaft of said speed reducer, and

(ii) a magnetic shield means mounted on said drive shaft for angular movement therewith in either direction between a first and second position, said angular movement corresponding with the door stroke, and

(2) a signal generating unit including

(i) a pair of magnetic reed switches, and

(ii) a pair of permanent magnets arranged in spaced, operative, registered relationship to the respective reed switches, and

(3) said magnetic shield means being angularly movable in a plane intermediate the reed switches and the magnets and passing between the reed switches and magnets during door opening and closing strokes to prevent the magnetic field produced by the magnets from reaching said reed switches, thereby actuating the reed switches to generate said sensing signal;

(e) a motor control circuit connected to the power source, said circuit being responsive to said driving signal for driving the motor in a normal direction, and said circuit being responsive to said sensing signal to decelerate the motor to dampen the movement of the door;

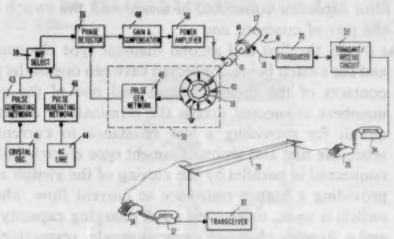
(f) means responsive to said sensing signal to regulate said motor control circuit to deenergize said motor to stop the door at the ends of its opening and closing strokes; and

(g) means operative through said motor control circuit, for driving the motor in its reverse direction a prescribed length of time after the generation of said driving signal has been stopped.

4,092,576
METHOD AND APPARATUS FOR FACSIMILE SCANNING

James G. Michner, Casselberry, Fla., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Oct. 14, 1975, Ser. No. 622,215
Int. Cl.[2] G05B 1/06
U.S. Cl. 318—314 15 Claims



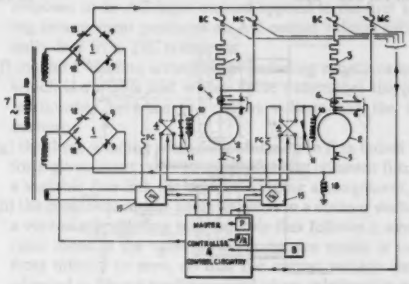
1. A facsimile unit comprising:
a scanning means;
information transducer means associated with said scanning means;
DC motor means;
means for coupling said DC motor means to said scanning means such that the scanning frequency of said scanning means is substantially less than the frequency of said DC motor means;
a source for generating a reference frequency signal; and
a phase locked loop comprising
scanning rate signal generating means more closely coupled and responsive to said DC motor means than said scanning means for generating a scanning rate indicative signal having a frequency substantially proportional to the frequency of said DC motor means and substantially larger than the scanning frequency of said scanning means;
phase comparator means coupled to said scanning rate signal generating means and said source for generating a reference frequency signal for comparing the frequency and phase of said scanning rate indicative signal with said reference frequency signal; and
motor drive means coupled to said phase comparator for dring said DC motor at a speed such that said scanning rate indicative signal is locked in phase to said reference frequency signal.

4,092,577
DYNAMIC BRAKING OF DIRECT CURRENT MOTORS

John David Markham, Manchester, England, assignor to Associated Electrical Industries Limited, London, England

Filed Feb. 16, 1977, Ser. No. 769,054
Claims priority, application United Kingdom, Feb. 19, 1976, 6665/76
Int. Cl.[2] H02P 3/12
U.S. Cl. 318—370 9 Claims

1. A dynamic braking system for a D.C. motor, including:
(I) a unidirectional series circuit comprising
(a) a D.C. motor armature,
(b) a first controllable D.C. power source having a permanent low-impedance path therethrough, and
(c) a brake resistor
said system further including
(II) switch means connected to said brake resistor for short-circuiting it prior to a motoring operation,
(III) a field winding of said D.C. motor,
(IV) a second controllable D.C. power source, to which said field winding is connected at least in a braking mode,
(V) reversing means for reversing the relative direction of current flow in said armature and said field winding,
(VI) control means for limiting operation of said reversing means to a condition of zero power output from said first D.C. power source, and
(VII) means for detecting the presence of armature current when said field winding is energised following operation of said reversing means,

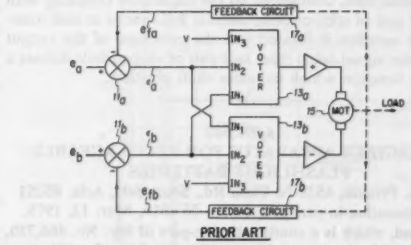


said control means being connected to prevent closure of said switch means when said means for detecting armature current is activated.

4,092,578
ELIMINATION OF VOTER CAUSED DEADZONE

Gordon R. Fabian, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 3, 1976, Ser. No. 747,450
Int. Cl.[2] G05B 9/03
U.S. Cl. 318—564 10 Claims



PRIOR ART

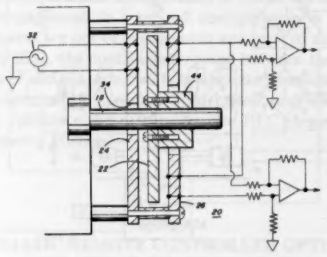
1. A dual channel closed loop servo system comprising:
servomotor means, and
two servomotor means drive circuits each comprising (a) signal comparison means for receiving both an input command signal and a feedback signal indicative of said servomotor means output position, and for producing a corrective error signal for inducing servomotor means response, (b) feedback means for producing said feedback signal, (c) mid-algebraic value voter means having three input means, the first input means connected to receive the error signal of one drive circuit, the second input means connected to receive the error signal of the other drive circuit, and (d) high-pass filter means connected between the third input means of said voter means and one of the other two input means of said voter means.

4,092,579

BRUSHLESS PRINTED CIRCUIT RESOLVER

James G. Weit, Pittsburgh, Pa., assignor to Contraves Goerz Corporation, Pittsburgh, Pa.

Filed Dec. 15, 1976, Ser. No. 750,907
Int. Cl.[2] G08C *19/16*
U.S. Cl. 318—662 **13 Claims**



1. A brushless resolver excitable by a carrier signal to provide a trigonometric position indication output of a shaft position defined by the envelope of the output carrier signal comprising:

a first flat stationary member;

a first pair of concentric annular foils formed on said stationary member having the carrier signal applied thereto;

a flat rotatable member separated from said stationary member by a small air gap, supported for rotary movement;

connecting means for connecting said flat rotatable member to the shaft;

a second pair of concentric annular foils formed on one side of said rotatable member facing said first pair of foils configured to maintain a constant capacitance with said first pair of foils as said rotatable member rotates;

a pair of semi-circular annular foils formed on the other side of said rotatable member electrically connected to said second pair of concentric foils;

a second flat stationary member; and,

a pair of shaped foils formed on said second flat stationary member, facing a portion of said pair of semi-circular annular foils, configured so the capacitive coupling with said pair of semi-circular annular foils varies as said rotatable member is rotated and the envelope of the output carrier signal taken from said pair of shaped foils defines a sine function which indicates shaft position.

4,092,580

ENERGIZER APPARATUS FOR RECHARGEABLE FLASHLIGHT BATTERIES

Onno M. Prinsze, 4528 N. Pima Rd., Scottsdale, Ariz. 85251

Continuation-in-part of Ser. No. 557,816, Mar. 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 466,710, May 3, 1974, abandoned. This application Sep. 27, 1976, Ser. No. 726,770
Int. Cl.[2] H02J *7/00*; F21L *1/00*
U.S. Cl. 320—2 **24 Claims**

1. A charging current for recharging batteries comprising:

current source means for providing a direct current input voltage;

contact means including at least a pair of contacts for connecting across the source or sources of direct current;

first and second contact members for connection across the terminals of a flashlight circuit; and

electric circuit means for interconnecting the contact means and the first and second contact members, including,

a first filament type electric bulb and a second filament type electric bulb in parallel with each other for limiting the current in the charging circuit, for providing the function of fuses to protect the charging circuit, and for providing visual indication of the operativeness of the charging circuit and of the charging mode,

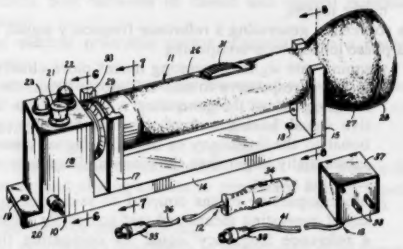
a diode in series with the first and second filament type electric bulbs,

a switch in series with one of the filament type electric bulbs for completing or interrupting the parallel connection of the first and second filament type electric bulbs depending on the position of the switch,

a filter capacitor connected in series with the switch across the pair of contacts, and

the diode, the first and second filament type electric bulbs and the switch being connected between one of the pair of contacts of the contact means and one of the contact members connected across the terminals of a flashlight circuit for providing a low resistance to current flow when the first and second filament type electric bulbs are connected in parallel by the closing of the switch and for providing a higher resistance to current flow when the switch is open, to provide a full charging capacity mode and a standby charging capacity mode, respectively, for the batteries.

10. Adapter cap apparatus for converting a flashlight into a rechargeable flashlight for use with a charger when the switch



of the electrical circuit of the flashlight is closed, comprising, in combination:

housing means having a first end and a second end and an outer periphery;

means for connecting the housing means to the flashlight at the second end of the housing means;

means disposed on the outer periphery of the housing means for connecting the housing means to the charger and for positioning the housing means relative to the charger for charging the flashlight;

a wall at the first end of the housing means having an aperture extending therethrough;

switch means disposed in the aperture and movable in the aperture between a first position and a second position, including a first portion disposed externally of the housing and a second portion integral therewith disposed internally of the housing means; and

means connected to the switch means for interrupting the electrical circuit in the flashlight and for connecting the electrical circuit of the flashlight to a source of direct current for charging the flashlight when the switch means is moved to the first position and for connecting the electrical circuit in the flashlight when the switch means is moved to the second position.

4,092,581

RECHARGEABLE BATTERY-OPERATED SHAVER WITH PRINTED CIRCUIT MODULE MOUNTING BRUSH MEANS, BATTERIES AND SWITCH MEANS

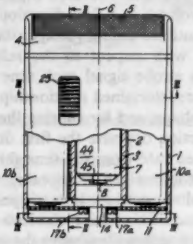
Enzo Ascoli, Lausanne, Switzerland, assignor to The Gillette Company, Boston, Mass.

Filed Feb. 3, 1977, Ser. No. 765,200

Claims priority, application United Kingdom, Feb. 18, 1976, 6308/76

Int. Cl.[2] H02J 7/00; H02K 5/14, 7/14

U.S. Cl. 320—2 15 Claims



1. A battery-powered electric dry shaver comprising:

a casing;

a printed circuit board received in said casing and having a plurality of conductive tracks;

an electric motor received in said casing and having conductive brush supports, and means mechanically mounting said conductive brush supports on said printed circuit board in direct electrical connection with respective first and second conductive tracks of said board;

rechargeable battery means being received in said casing and having positive and negative terminals, and means mounting said battery means in said casing with said positive and negative terminals respectively being in electrical connection with said first conductive track and a third conductive track of said board; and

electric switch means received in said casing and including a conductive switching element, and means mounting said switching element on said board for movement between an "OFF" position and an "ON" position, said switching element in said "ON" position electrically interconnects said second conductive track to said third conductive track of said board, whereby to connect said battery terminals to said brush supports through said switching element and said conductive tracks, to permit current to flow from said battery to said motor to drive said shaver.

4,092,582

ELECTRICAL COUPLING ARRANGEMENTS

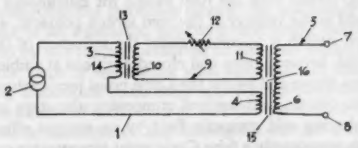
Adrian Orton Newbould, Stafford, England, assignor to The General Electric Company Limited, London, England

Filed Dec. 3, 1976, Ser. No. 747,241

Claims priority, application United Kingdom, Dec. 12, 1975, 50972/75

Int. Cl.[2] H01F 39/00

U.S. Cl. 323—48 6 Claims



1. An electrical coupling arrangement comprising:

(a) a first winding arrangement;

(b) a second winding arrangement;

(c) a third winding arrangment;

(d) the three winding arrangements being constructed and relatively located to be linked by magnetic flux produced thereby;

(e) the parameters of the first and second winding arrangements being such that the second winding arrangement in response to an AC input current applied to the first winding arrangement produces an AC output voltage substantially free from DC transients;

(f) the third winding arrangement including resistance means which is variable and whose value determines the phase relationship between the output voltage and the input current;

(g) the three winding arrangements being so flux linked that, for a given input current, a substantially constant flux and a variable flux link the second winding arrangement; and

(h) the resistance means being variable in a manner such that a vector representing said variable flux follows a semicircular locus as the value of the resistance means is varied from infinity to zero, so that the output voltage can be adjusted to have a predetermined phase relationship to the given input current and an amplitude proportional to that of the given input current.

4,092,583

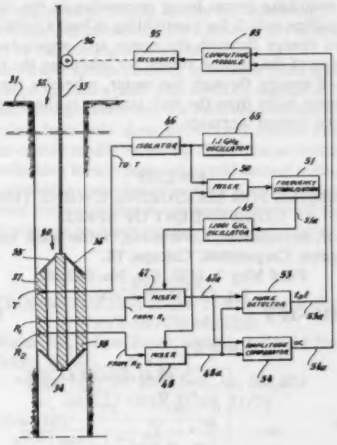
APPARATUS AND METHOD FOR DETERMINATION OF SUBSURFACE POROSITY UTILIZING MICROWAVE ELECTROMAGNETIC ENERGY

George R. Coates, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Mar. 3, 1977, Ser. No. 773,996

Int. Cl.[2] G01V 3/12, 3/18

U.S. Cl. 324—6 29 Claims



1. Apparatus for determining the water-filled porosity of formations surrounding a borehole, said formations including fluid in a matrix, comprising:

means for deriving a first quantity which is a measure of the travel time of microwave electromagnetic energy propagating over a predetermined distance in the formations;

means for deriving a second quantity which is a measure of the attenuation of said microwave electromagnetic energy propagating over said predetermined distance in the formations;

means responsive to said second quantity for generating a third quantity which is representative of the travel time of microwave electromagnetic energy propagating over said predetermined distance in water having a lossiness determined from said second quantity; and

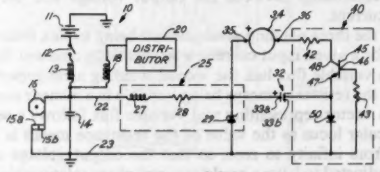
means responsive to said first and third quantities for generating a porosity-indicative quantity as the function of said first and third quantities.

4,092,584

DWELL MEASURING APPARATUS

Richard A. Karlin, Chicago, Ill., assignor to Sun Electric Corporation, Chicago, Ill.

Filed Apr. 21, 1977, Ser. No. 789,408
Int. Cl.² G01R *13/42*
U.S. Cl. 324—16 R **6 Claims**



1. Apparatus for measuring the dwell of an engine ignition system employing an ignition switch periodically opened and closed in synchronism with the engine, said ignition switch generating an ignition signal when the switch is open, said apparatus comprising:

shaping means for shaping the ignition signal to form a charging pulse;

storage means for storing at least part of the energy in the charging pulse;

meter means including a pointer normally located in a zero position indicating minimum dwell in the absence of current flow through the meter means; and

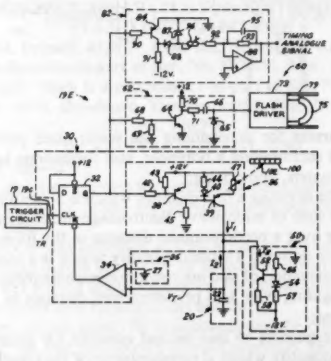
switching means connected in series with the meter means, said switching means being responsive to the closure of the ignition switch for transmitting at least a portion of the stored energy through the meter and responsive to the opening of the ignition switch for inhibiting the transmission of energy through the meter, whereby the pointer advances away from the zero position as the dwell of the ignition system increases.

4,092,585

APPARATUS FOR MEASURING ENGINE TIMING INDEPENDENT OF SPEED

Johannes P. Bovenlander, Kormmenie, Netherlands, assignor to Sun Electric Corporation, Chicago, Ill.

Filed May 3, 1976, Ser. No. 682,381
Int. Cl.² F02P *17/00*
U.S. Cl. 324—16 T **5 Claims**



1. Engine timing measuring apparatus for an engine having a chamber, a member movable in the chamber, combustion means for creating the combustion of fuel in the chamber so that the member is driven with respect to the chamber and an indicia to indicate the relative position of the chamber and the member, said apparatus comprising:

lamp means for illuminating the indicia in response to a strobe signal;

trigger means for generating a trigger signal in response to the operation of the combustion means to create the combustion of fuel in the chamber;

means for storing a variable timing voltage;

reference means for generating a reference voltage, said reference voltage being fixed during normal operation;

control means responsive to each trigger signal for altering the timing voltage in a first direction at a first predetermined rate until the timing voltage attains a predetermined relationship with respect to the reference voltage, for generating a strobe signal each time the timing voltage attains the predetermined relationship with respect to the reference voltage, and for altering the timing voltage in a second direction opposite the first direction at a second predetermined rate from the time the timing voltage attains the predetermined relationship with respect to the reference voltage until the next trigger signal is generated;

adjustment means for altering the first predetermined rate until the lamp means illuminates the indicia in a predetermined position; and

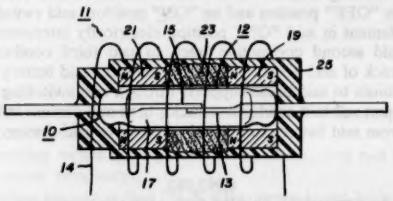
scale means connected to the adjustment means for displaying the degree of movement of the member relative to the chamber between the time the trigger signal is generated and the time the lamp means is illuminated, whereby the degree of movement is accurately displayed irrespective of changes in speed of the member relative to the chamber.

4,092,586

TEMPERATURE-SENSING CIRCUIT

Leonard R. Dinkler, Gainesville, and Jerry Herrin, Alachua, both of Fla., assignors to General Electric Company, Gainesville, Fla.

Filed Oct. 20, 1975, Ser. No. 623,781
Int. Cl.² G01R *31/02*
U.S. Cl. 324—28 RS **8 Claims**



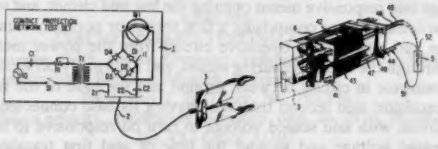
1. A method for intermittently interrogating a temperature-sensing circuit to verify the operative condition thereof at ambient temperatures which may be different from the in-situ ambient temperature during interrogation, said circuit comprising an in-situ reed switch and magnetic means associated therewith, including temperature-responsive ferrite means in magnetic circuit with the reed switch for establishing a magnetic field in the vicinity of the reed switch contacts, whereby said reed switch is operable, under the influence of the magnetic field, between open and closed positions at ambient temperatures above and below the Curie point temperature of the magnetic circuit, said method comprising the steps of selectively altering said magnetic field by an amount effective to establish temporarily a false Curie point temperature causing a reed switch to change from one to the other of said positions, and providing an indication of the position of said reed switch prior and subsequent to the alteration of the magnetic field.

4,092,587

CONTACT PROTECTION TEST SET

Charles Fred Selkow, Jr., Reynoldsburg, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 1, 1976, Ser. No. 719,614
Int. Cl.[2] G01R *31/02*
U.S. Cl. 324—28 R 6 Claims



1. A test set for testing contact protection networks comprising

means for generating a test signal;

means connected to said generating means for analyzing the contact protection networks; and

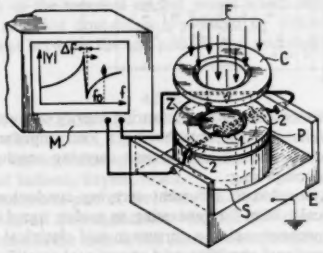
means for selectively connecting said test set to ones of the contact protection networks comprising a pair of insulating elongated members each having a tapered operative end, contact means attached to said tapered operative end of one of said elongated members and to the tapered operative ends of both of said elongated members, hinge means supporting said elongated members for enabling both angular and parallel lateral relative movement thereof to selectively couple said contact means with ones of the contact protection networks, and conductor means for coupling said contact means with said analyzing means.

4,092,588

METHOD OF MONITORING THE MACHINING BY ION BOMBARDMENT OF A PIEZOELECTRIC WAFER

Bernard Desormiere, and Marc Berte, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Mar. 2, 1977, Ser. No. 773,688
Claims priority, application France, Mar. 5, 1976, 76 06351
Int. Cl.[2] C23C *15/00*; G01R *29/22*
U.S. Cl. 324—56 7 Claims



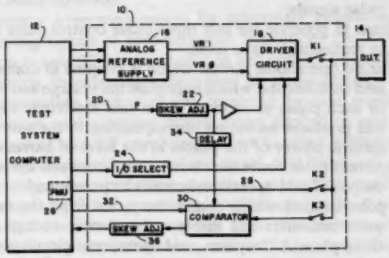
1. A method of monitoring the progress of the ion machining of a wafer of piezoelectric material used in the manufacture of an electromechanical resonator device, the machining being performed in an evacuated enclosure and being electrically monitored by an external measuring device, said method comprising the steps of associating with said wafer at least two measuring electrodes, connecting said electrodes to the measuring terminals of said device; said device measuring the impedance or admittance value linking the current it supplies with the voltage appearing across said measuring terminals; said device including a variable-frequency alternating source and display means, which as a function of said variable frequency, displays the variation of said impedance or admittance value.

4,092,589

HIGH-SPEED TESTING CIRCUIT

Yuk Bun Chau, Fremont; George Niu, Santa Clara, and Rudolph Staffelbach, Mountain View, all of Calif., assignors to Fairchild Camera and Instrument Corp., Mountain View, Calif.

Filed Mar. 23, 1977, Ser. No. 780,382
Int. Cl.[2] G01R *15/12*
U.S. Cl. 324—73 R 9 Claims



1. A high-speed testing circuit for applying test stimuli input signals to an electronic device and for receiving from said device output signals generated in response to test stimuli signals originating from another source, said testing circuit including:

a. voltage reference circuitry for supplying a pair of D.C. signals at first and second voltage levels, said circuitry including input means for receiving D.C. signals at first, second, third, and fourth voltage levels and means for selecting appropriate first and second levels for testing the electronic device;

b. skew adjustment circuit means for receiving a train of high frequency pulses and for adjusting the time of occurrence of the leading and trailing edges;

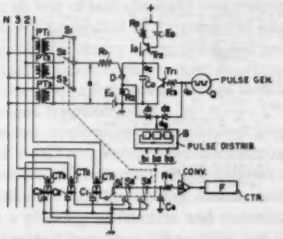
c. driver circuit means coupled to receive from said voltage reference circuitry said pair of D.C. signals at first and second voltage levels and for receiving the adjusted train of pulses from said skew adjustment circuit means, said driver circuit means including electronic switching means for switching to said first and to said second voltage levels at a switching rate determined by the frequency of said adjusted train of pulses to generate test stimuli signals for application to an input terminal of said electronic device.

4,092,590

ELECTRONIC THREE-PHASE FOUR-WIRE SYSTEM WATT-HOUR METER

Kazumi Watanabe, Tokyo, Japan, assignor to Osaki Electric Co. Ltd., Tokyo, Japan

Filed May 30, 1975, Ser. No. 582,423
Int. Cl.[2] G01R *21/06, 11/16*
U.S. Cl. 324—107 4 Claims



1. An electronic three-phase four-wire system watt-hour meter comprising:

three voltage transformers and three current transformers which respond, at reduced values, to voltages and currents of each phase of a three-phase four-wire system A.C. load which is to be measured, said transformers including primary and secondary windings;

electronic switches for voltage and current which are connected to the secondary windings for each of the voltage transformers and current transformers and are adapted for being cyclically opened and closed by three-phase control pulse signals;

means to generate the said three-phase control pulse signals in rectangular wave form;

a single operational circuit which is coupled in common to said switches and which multiplies the voltage and current of each phase as received from said electronic switches and produces an output corresponding to the sum of the electric power of the phases in the form of current;

a current-pulse converter circuit which converts the current output of said operational circuit to pulses; and

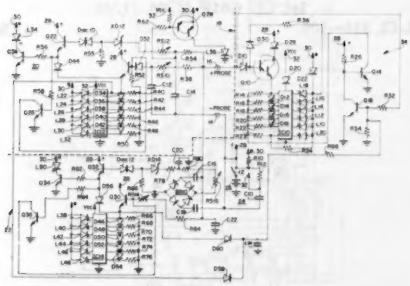
a pulse counter which counts the pulses from the current-pulse converter and displays the electric energy of the three-phase A.C. system, said operational circuit comprising pulse distributor means, trigger means, first and second reference power sources, a capacitor, first and second transistors, a pulse generator and first and second diodes, said pulse generator generating a pulse signal havng high and low levels and a frequency substantially greater than that of the three-phase system to be measured, said first transistor being coupled to said pulse generator and across said capacitor and shorting the latter when the pulse signal is at the high level, said first diode being coupled between said trigger means and said pulse distributor means, said second diode being coupled between said pulse generator and said pulse distributor means and passing positive pulses to the latter, said pulse distributor means upon receipt of a positive pulse from said second diode terminating generation of pulses and opening said electronic switches thereby shorting the secondaries of the current transformers, said first transistor responsing to the low level of the pulse signal to permit said capacitior to be charged via said second transistor from said first power source, said trigger means being fired when the voltage of said capacitor reaches a value related to that of said second power source and the secondary of the voltage transformer whereupon said distributor means commences a sequential operation of said switches.

4,092,591

ELECTRIC METER

Joseph F. Lozowski, 4753 58th St. N., St. Petersburg, Fla. 33709

Filed Aug. 6, 1975, Ser. No. 602,217
Int. Cl.[2] G01R *1/36, 15/12*
U.S. Cl. 324—110 **8 Claims**



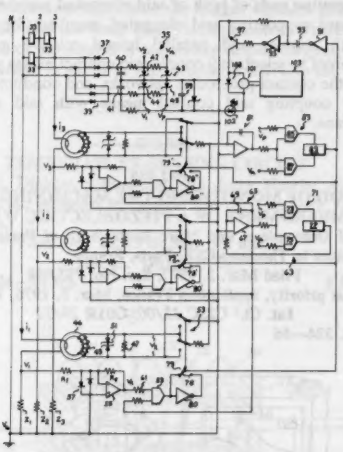
1. A combined meter for measuring both voltage and ohms, comprising means for measuring ohms, means for measuring voltage, means for providing electric power to operate the ohms measuring means, means in circuit with the power means and both of the measuring means for connecting the power and measuring means with a component to be measured, and means responsive to the connecting means sensing voltage for taking the power means and the ohms measuring means out of circuit before the sensed voltage can pass through said ohms measuring means, the responsive means comprising switching means normally retaining said power means and ohms measuring means in operative circuit and responsive to said sensed voltage said responsive means opening the last said circuit, and said switching means comprising a first transistor normally turned on and closing said operative circuit from the power means through the ohms measuring means, and a normally off second transistor in circuit between ground and the base of the first transistor, said second transistor having its base connected in circuit with said sensed voltage to turn on responsive to said sensed voltage and ground the base of said first transistor, opening said operative circuit.

4,092,592

ELECTRONIC KWH METER HAVING VIRTUAL GROUND ISOLATION

Miran Milkovic, Scotia, N.Y., assignor to General Electric Company, Somersworth, N.H.

Filed Jan. 7, 1977, Ser. No. 757,801
Int. Cl.[2] G01R *21/06*
U.S. Cl. 324—142 **9 Claims**



1. An electronic meter for measuring energy consumed in an electrical system of the type having a load impedance connected across reference and current carrying conductors of said system comprising:

a. means coupled to a current carrying conductor of said electrical system for generating an analog signal having a value proportional to a current in said electrical system;

b. an operational amplifier, said operational amplifier having a feedback resistor connected across input and output terminals thereof and an input resistor connected at one end to the input terminal of said operational amplifier and at the other end to the current carrying conductor of said electrical system, the resistance of said input resistor being of a substantially larger value than the input impedance of said operational amplifier so as to establish, at the input of said operational amplifier, such a small fraction of a voltage appearing across said load impedance that said operational amplifier is virtually isolated from said electrical system, said operational amplifier generating a first output signal having a value proportional to the voltage across said load impedance;

c. means for multiplying said analog signal by said first output signal to generate a second output signal having a

value proportional to instantaneous power in said electrical system;

d. means for converting said second output signal to a pulse train having a pulse repetition frequency proportional to the energy consumed in said electrical system; and

e. means responsive to the pulse train from said means for converting for recording and displaying the energy consumed in said electrical system.

4,092,593

CIRCUIT BOARD TESTING MACHINE

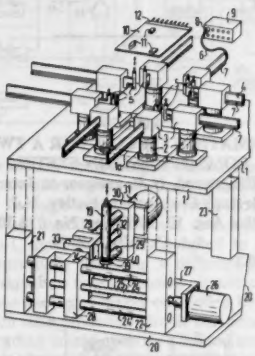
Hermann Wolk, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 2, 1977, Ser. No. 793,136

Claims priority, application Germany, Jun. 24, 1976, 2628428

Int. Cl.[2] G01R *31/02*

U.S. Cl. 324—158 F **10 Claims**



1. A machine for testing a plurality of terminal and/or test points of an assembly arranged on a support to a measuring circuit through at least one test pin, wherein said test pins (5) are arranged to be movable approximately parallel to the surface of said support (10), a carrier (19) moveable in two coordinate directions, a pair of controllable drive devices (26, 31) connected to move said carrier to located said test pins (5) when these are in the rest position and to individually engage one of said test pins and transport it to a desired coordinate location of the terminal or test points which are to be contacted, and that contacting is effected by virtue of relative movement between the test pins (5) and said support (10).

4,092,594

CRYSTALLESS SCANNING RADIO RECEIVER CONTROLLED BY PROCESSING MEANS

William Baker, Indianapolis, Ind., assignor to Masco Corporation of Indiana, Taylor, Mich.

Continuation-in-part of Ser. No. 582,338, May 30, 1975, Pat. No. 3,962,644. This application May 24, 1976, Ser. No. 689,364

The portion of the term of this patent subsequent to Jun. 8, 1993, has been disclaimed.

Int. Cl.[2] H04B *1/44, 1/26*

U.S. Cl. 325—21 **33 Claims**

33. Apparatus for transmitting and for receiving a plurality of predetermined radio frequency channels located in one or more RF bands, said apparatus comprising:

a RF receiving section for the RF band, including a RF amplifier and a RF mixer, said RF receiving section providing an intermediate signal when a radio frequency signal is received on a channel;

a RF transmitting section for one or more RF bands and including means for modulating a RF signal with an information signal, means for amplifying said modulated signal for transmission;

an IF section operably connected to said RF band mixer and including an IF amplifier for amplifying the intermediate signal received from said RF receiving section;

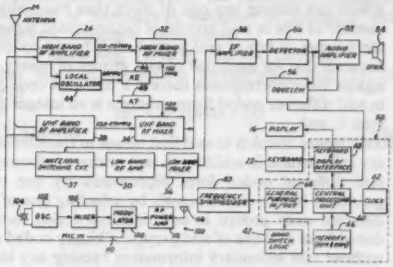
detector means for producing an audio signal when said intermediate signal is being received;

an audio amplifier connected to said detector means for driving an audio speaker with said audio signal;

means for disabling the audio amplifier when no audio signal is being received and for producing an indicating signal for application to a processing means when an audio signal is being received;

frequency generating means for selectively generating selecting signals of predetermined frequencies for application to said RF receiving section and said RF transmitting section, for selecting a frequency for transmitting by said transmitting section or for receiving by said receiving section, said selecting signals being applied to said RF mixer of said RF receiving section to select a frequency and provide said intermediate signal, said frequency generating means including a voltage controlled oscillator being adapted to provide said selecting signals of preselected frequencies in response to a preselected voltage level being applied thereto, said oscillator output signal frequency varying in proportion to the voltage level applied at the input of said oscillator;

memory means for storing operating instructions for use by a processing means and for storing information for a plurality of channels;



means for converting a digital word signal to a voltage level, said converting means having its output connected to the input of said voltage controlled oscillator so that the voltage level applied thereto varies in accordance with the digital information applied to said converting means;

processing means for controlling said frequency generating means and for loading and retrieving information and instructions from said memory means, said processing means being adapted to retrieve information concerning said channels from said memory means and provide digital information to said converting means so that said converting means applies the proper voltage to said voltage controlled oscillator so that said apparatus can either transmit or receive on one of said channels, said processing means being operably connected to the output of said oscillator to monitor the frequency being generated and to adjust the digital information applied to said converting means if the oscillator output frequency deviates from the desired predetermined frequency; and

keyboard means comprising a plurality of keys operably connected to said processing means for entering and loading instructions and frequency information for controlling the operation of said processing means, said keyboard including a plurality of function and numerical keys for entering decimal frequency information and for controlling said apparatus in its transmitting and receiving operations.

4,092,595

DATA TRANSMISSION SYSTEM FOR TRANSMITTING PRIMARY AND SECONDARY INTELLIGENCE

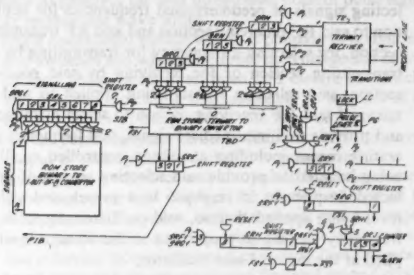
Donald Adams Weir, Goff's Oak, Nr. Cheshunt, and Eric Stanley Usher, Ware, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 24, 1976, Ser. No. 744,551

Claims priority, application United Kingdom, Dec. 30, 1975, 53123/75

Int. Cl.[2] H04L *1/00*

U.S. Cl. 325—38 A 37 Claims



20. A data transmission transmitter comprising:

first means to convert groups of binary coded digital signals for transmission of primary information into groups of digital signals is a different coded form each element of which can assume any one of more than two values, the number of bits in said groups of binary coded signals and the number of bits in said groups of different coded form are such that for each one of said groups of binary coded signals there corresponds thereto *n* different code groups in said different coded form, where *n* is an integer greater than 1; and

second means coupled to said first means to transmit secondary information in addition to said primary information in said different coded form represented by one of said groups of binary coded signals by selecting one of said *n* different code groups in said different coded form produced from said one of said groups of binary coded signals without said secondary information causing any interference with said primary information.

4,092,596

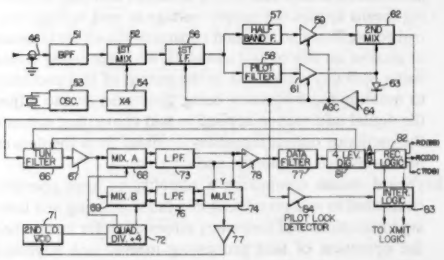
DATA TRANSMISSION AND RECEPTION SYSTEM

Robert V. C. Dickinson, 32 Debbie Pl., Berkeley Heights, N.J. 07922; Alan W. Entenman, 27 Beacon La., Hicksville, N.Y. 11801, and Jans Kliphuis, 124 Southdown Rd., Huntington, N.Y. 11743

Filed Apr. 13, 1976, Ser. No. 676,558

Int. Cl.[2] H04B *1/68*

U.S. Cl. 325—49 15 Claims



7. A data transmission system comprising:

receiver means to receive signals comprising first and second pilot carrier signals and at least one selected suppressed carrier modulated signal modulated by a data-based signal;

a first mixer connected to receive said first pilot carrier signal and a band of frequencies that includes said selected signal to beat said band of frequencies with said first pilot carrier to convert said selected signal to a signal in an intermediate frequency band;

a second mixer means connected to receive said selected signal in said intermediate frequency band;

signal supply means connected to said second mixer means to supply thereto a signal having a frequency corresponding to the suppressed carrier of said selected signal supplied to said second mixer to demodulate said selected signal; and

low pass filter means connected to said second mixer means to shape the demodulated signal therefrom.

4,092,597

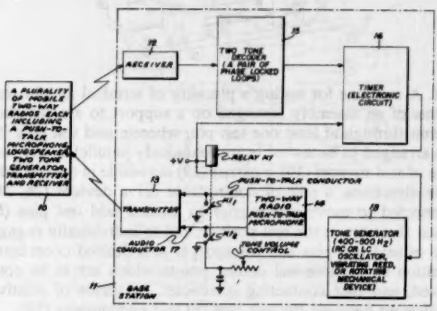
CONFIRMATION CIRCUIT FOR A TWO-WAY COMMUNICATION SYSTEM

Harry Place, Ridgewood, N.J., assignor to International Telephone & Telegraph Corporation, Nutley, N.J.

Filed Aug. 10, 1976, Ser. No. 713,303

Int. Cl.[2] H04B *7/00*

U.S. Cl. 325—53 18 Claims



1. A confirmation circuit to generate only a single confirmation tone for transmission from a base station to one of a plurality of remote two-way radios of a two-way communication system comprising:

first means disposed in said base station to decode at least two simultaneously received calling tones each having a different frequency transmitted from said one of said plurality of remote radios to said base station and to produce a first control signal upon cessation of said two calling tones;

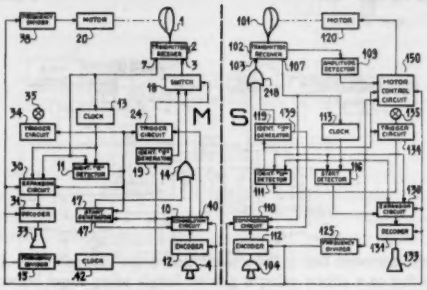
second means disposed in said base station coupled to said first means responsive to said first control signal to produce a second control signal in the form of a pulse having a predetermined duration; and

third means disposed in said base station coupled to said second means responsive to said second control signal to transmit only said single confirmation tone having a single frequency different than the frequencies of said two calling tones from said base station to said one of said plurality of remote radios for said predetermined duration to indicate that said base station is ready to receive intelligence transmitted from said one of said plurality of remote radios.

4,092,598
STATIONS FOR RADIOELECTRIC TRANSMISSION

Pierre Deman, and René Lechevin, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 23, 1976, Ser. No. 744,277
Claims priority, application France, Nov. 27, 1975, 75 36356
Int. Cl.² G01S 1/02
U.S. Cl. 325—55 6 Claims

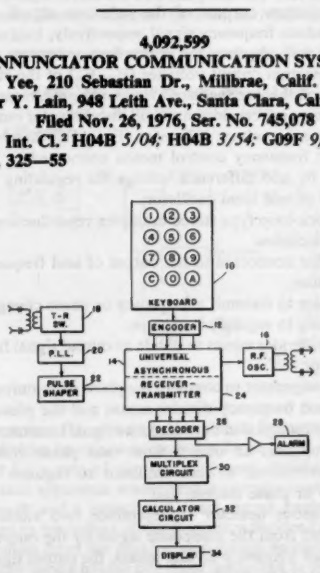


1. A master station comprising: a directive antenna; means for rotating at a uniform speed the beam of said antenna; means for receiving through said antenna radio frequency signals representative of digital signals and delivering said digital signals; n, $n>1$, detecting means coupled to said receiving means for respectively detecting n different digitally coded identification signals; n time expansion circuits coupled to said receiving means and respectively controlled by said n detecting means, each time expansion circuit comprising a memory, means for recording in said memory a limited number of digital signals delivered by said receiving means upon an identification signal having been detected by the detecting means controlling this time expansion circuit, and means for reading the digital signals recorded in said memory; means for generating a digitally coded master station identifying signal; and additional means for recurrently transmitting through said antenna radio frequency signals representative of said identifying signal.

4,092,599
ANNUNCIATOR COMMUNICATION SYSTEM

Werner Yee, 210 Sebastian Dr., Millbrae, Calif. 94030, and Victor Y. Lain, 948 Leith Ave., Santa Clara, Calif. 95054

Filed Nov. 26, 1976, Ser. No. 745,078
Int. Cl.² H04B 5/04; H04B 3/54; G09F 9/32
U.S. Cl. 325—55 10 Claims



1. An annunciator communications system comprising a plurality of identical transmitter-receiver units each having the capability of signaling and communicating with all of said units, each of said units comprising:

data input means for entering data to be transmitted and for converting said data into corresponding binary coded data signals, said data input means including a plurality of manually operated switches;

transmitting means coupled to said data input means for receiving each of said data signals in parallel from said input means and for transmitting said data signals in series through a communications medium;

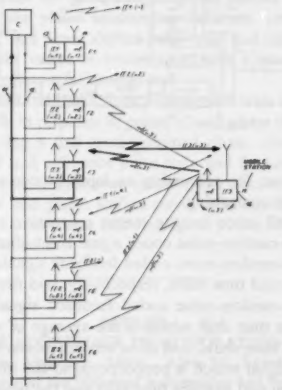
receiving means for receiving an input signal from said communications medium, said receiving means including circuitry for detecting and decoding said binary signals and for producing an output signal at one of a plurality of output terminals, each of said output terminals corresponding to one of said plurality of switches in said data input means; and

display means coupled to said receiving means for visibly displaying a character represented by said output signal, said display means including means for displaying additional characters and for continuing the display of said characters until said display means is cleared by a signal originating at said data input means.

4,092,600
INSTALLATION FOR TWO-WAY RADIO COMMUNICATION

Alois Zimmermann, Langendorf, and Hansruedi Müller, Solothurn, both of Switzerland, assignors to Autophon Aktiengesellschaft, Solothurn, Switzerland

Filed Aug. 11, 1976, Ser. No. 713,496
Claims priority, application Switzerland, Aug. 27, 1975, 11095/75
Int. Cl.² H04B 1/00
U.S. Cl. 325—55 3 Claims



1. In an installation for two-way radio communication between a fixed dispatching center and at least one mobile station moving within a specific area beyond the service range of a single fixed transmitting and receiving station, of the type wherein information directed to said mobile station from said dispatching center is simultaneously transmitted over a plurality of transmitters in respective fixed stations disposed at various locations within said area at differing frequencies respectively assigned to each of said fixed stations, wherein said information is received at said mobile station by a single receiver capable of being switched to whichever of said differing frequencies offers the most favorable reception by circuitry for checking the received field strength at each of said frequencies and for controlling the incoming frequency, and wherein information directed to said dispatching center by said mobile sta-

tion is transmitted at a single frequency receivable by said fixed stations, the improvement comprising:

allocation to each said fixed station of a signalling frequency outside the voice frequency band for identifying the respective said fixed station,

first circuit means disposed in said mobile station for modulating the identifying signal corresponding to the last-received said fixed station upon the transmitter of said mobile station, and

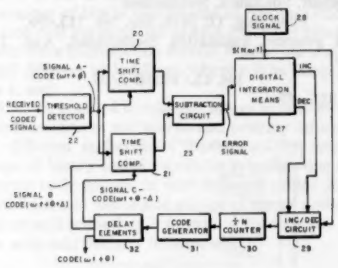
second circuit means disposed in each said fixed station for connecting the receiver output thereof with said dispatching center only when the frequency of the received identifying signal corresponds to the signalling frequency identifying the respective said fixed station, whereby only the said receiver output of the particular said fixed station whose said transmitter output signal is received at said mobile station is connected to said dispatching center.

4,092,601

CODE TRACKING SIGNAL PROCESSING SYSTEM

William H. Lee, Boston, and Duncan B. Cox, Jr., Manchester, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Jun. 1, 1976, Ser. No. 691,581
Int. Cl.[2] H04L 7/04
U.S. Cl. 325—322 **15 Claims**



1. A system for processing an input pseudo-random-noise coded signal comprising

a time-shift error sensing means responsive to said input pseudo-random-noise coded signal and to first and second pseudo-random-noise coded feedback signals having first and second time shifts, respectively, said first and second pseudo-random-noise coded feedback signals having an average time shift which is the average of said first and second time shifts, said error sensing means producing an error signal which is proportional to the time difference between said average time shift and the time shift of said input signal and which at any instant of time assumes one of a plurality of different values such that the time average of said error signal represents said time difference;

means responsive to said error signal for digitally integrating said error signal and for generating a control signal which is a function of said digitally integrated error signal;

means responsive to said control signal and to a pulsed clock signal for controllably changing the number of pulses in said pulsed clock signal to produce an intermediate signal having a controlled pulse rate; and

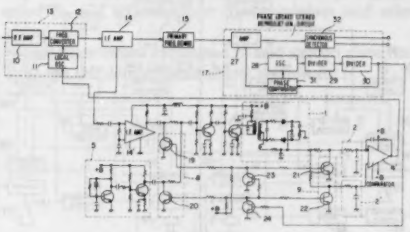
means responsive to said intermediate signal for producing said first and second pseudo-random-noise coded feedback signals and for producing a third pseudo-random-noise coded signal which is driven toward time synchronism with said input coded signal.

4,092,602

AUTOMATIC FREQUENCY CONTROL FOR FM-RECEIVER

Yuji Nishioka, Takatsuki; Tetsuya Tokyama, Higashi-Osaka, and Toshiyuki Takei, Hirakata, all of Japan, assignors to Onkyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 1, 1976, Ser. No. 691,868
Claims priority, application Japan, Jun. 2, 1975, 50-66792
Int. Cl.[2] H04B 1/16
U.S. Cl. 325—346 **1 Claim**



1. An automatic frequency control device for an FM-receiver of the type having a frequency convertor, an intermediate frequency amplifier and a frequency demodulator, and in which the frequency convertor is provided with a local oscillator to convert an incoming carrier into an intermediate frequency signal, said automatic frequency control device comprising:

means for developing a reference signal having a predetermined intermediate frequency (f_o);

means for developing a switching signal of 50% duty cycle;

a frequency discriminator;

means for connecting said discriminator alternately to said reference signal and to said intermediate frequency signal obtained from said intermediate frequency amplifier synchronously with said switching signal;

means for switching the output of said discriminator synchronously with said switching signal to obtain separate discrimination outputs of the reference signal and the intermediate frequency signal respectively;

means for deriving, from the discrimination outputs, average discrimination output voltages (E_D, E_R) of the reference signal and the intermediate frequency signal, respectively;

subtractor means connected to said discriminator outputs for obtaining the voltage difference ($E_D - E_R$) therebetween;

automatic frequency control means connected to be controlled by said difference voltage for regulating the frequency of said local oscillator;

a phase-lock-loop type stereo multiplex reproduction circuit which includes:

an amplifier connected to the output of said frequency demodulator;

an oscillator to transmit a frequency or phase change signal according to regulation voltage;

frequency divider means to divide an output signal from said oscillator;

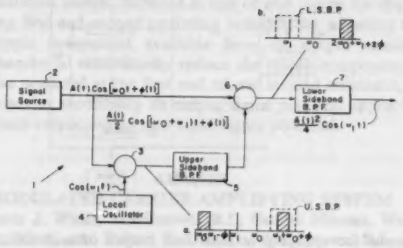
a phase comparator to compare the phase of an output signal from said frequency divider means and the phase of the stereo pilot signal in the composite signal transmitted from said amplifier, an output from said phase comparator being connected to said oscillator to regulate the frequency or phase thereof; and

a synchronous detector to reproduce two audio signals separated from the composite signal by the output signal from said frequency divider means, the output signal from said frequency divider means being further used as said switching signal.

4,092,603
SYSTEM FOR OBTAINING PULSE COMPRESSION IN THE FREQUENCY DOMAIN

John B. Harrington, Los Alamitos, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Sep. 16, 1976, Ser. No. 723,870
Int. Cl.[2] H04B 1/10
U.S. Cl. 325—473 4 Claims

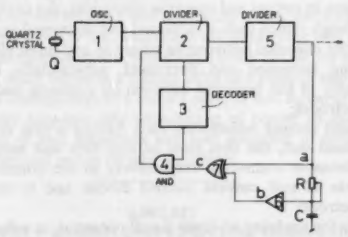


1. A system for removing phase coding and distortion from a coded input pulse signal having a pulse width τ to achieve signal compression in the frequency domain comprising:
   a. a local oscillator for generating a constant frequency signal,
   b. a first mixer for combining the coded input pulse signal and the constant frequency signal to form a resultant signal,
   c. an upper sideband bandpass filter for processing the resultant signal to obtain an upper sideband signal,
   d. a second mixer for combining the coded input pulse signal and the upper sideband signal to obtain an unfiltered output signal, and
   e. a lower sideband bandpass filter coupled to the second mixer for filtering the unfiltered output signal to obtain an output pulse signal having a pulse width substantially equal to τ independent of the frequency or phase of the coded input signal.

4,092,604
APPARATUS FOR ADJUSTING THE OUTPUT FREQUENCY OF A FREQUENCY DIVIDER

Jean-Claude Berney, Chemin du Bois de Menton, Epalinges, Switzerland

Claims priority, application Switzerland, Dec. 23, 1975, 16670/75
Filed Dec. 17, 1976, Ser. No. 751,974
Int. Cl.[2] H03K 21/32, 1/16
U.S. Cl. 328—48 7 Claims

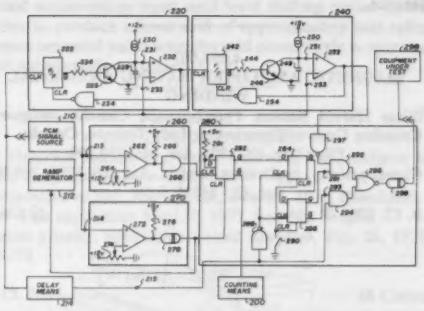


1. Apparatus for adjusting the output frequency of a frequency divider having two inputs one for an initial rate $n_o x$ and a second for a rate of $n'x$, said frequency divider having an output, said apparatus comprising a circuit constituted of a resistance R and a capacitor C, said circuit having an input connected to the output of the frequency divider for receiving output pulses from the divider, said circuit having an output, comparator means having one input connected to the output of the RC circuit and a second input connected to the output of the divider for receiving normal pulses from the divider and pulses with a delay t proportional to the time constant RC from the RC circuit for comparing the delayed pulses with the normal pulses, said comparator means having an output at which are produced control pulses of duration t, and switching means coupled to the output of said comparator means and to said divider for switching the rate of the divider to the value $n'x$ during the duration of the control pulses.

4,092,605
PHASE DELAY SIMULATOR

James Michael Donnelly, Carol Stream, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 13, 1976, Ser. No. 749,640
Int. Cl.[2] H03K 5/15, 5/18
U.S. Cl. 328—152 17 Claims



1. A phase shifting circuit comprising:
means for generating a reference pulse train;
shifting means for generating a phase shifted pulse train wherein the phase relationship between corresponding pulses of said phase shifted pulse train and said reference pulse train varies in accordance with a predetermined variable phase relationship; and
means for selecting said phase shifted pulse train as an output pulse train in response to pulses of said phase shifted pulse train having a first predetermined phase relationship to pulses of said reference pulse train and for selecting said reference pulse train as an output pulse train in response to pulses of said phase shifted pulse train having a second predetermined phase relationship to pulses of said reference pulse train.

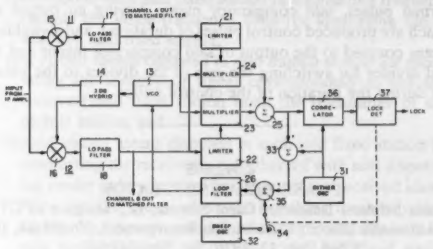
4,092,606
QUADRAPHASE DEMODULATION

Carl R. Ryan, Hancock, Mich., Alan M. Lovelace, Acting Administrator of the National Aeronautics and Space Administration, with respect to an invention of Carl R. Ryan, Hancock, Mich.

Filed Jun. 21, 1977, Ser. No. 808,510
Int. Cl.[2] H03D 3/00
U.S. Cl. 329—124 14 Claims

1. A phase locked loop for demodulating a suppressed carrier QPSK modulated input signal that is subject to noise to cause phase shift of phase indications for first and second binary modulation channels, comprising a coherent reference source, means responsive to the coherent source and input signal for deriving first and second replicas of the binary information in the first and second channels, means for combining said replicas to derive a variable amplitude error signal, a dither oscillator, means for controlling the frequency of said coherent source in response to the error signal and an output of

the dither oscillator, and means for comparing the error signal with the dither oscillator output to provide an indication of



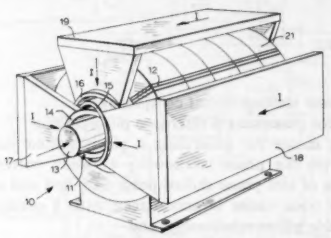
phase lock between the suppressed carrier and the coherent reference.

4,092,607

MAGNETIC AMPLIFIER HAVING A CO-AXIAL WINDING

William Harold Robins, Peterborough, Canada, assignor to Canadian General Electric Co., Ltd., Toronto, Canada

Filed Dec. 13, 1976, Ser. No. 750,304
Claims priority, application Canada, Aug. 19, 1976, 259482
Int. Cl.[2] H03F *9/00*
U.S. Cl. 330—8 10 Claims



1. A magnetic amplifier comprising:
(a) a hollow cylindrical saturable core of magnetic material,
(b) a gate winding linked to said core and comprising a plurality of co-axial conductors passing longitudinally through said core and insulated therefrom, said co-axial conductors being interconnected, externally of said core, in such a manner that said co-axial conductors form a series circuit such that the currents passing through said co-axial conductors flow in the same direction in all said co-axial conductors,
(c) and a control winding linked to said core and adapted to be energized from a source of adjustable DC voltage that provides an adjustable magnetomotive force level bias in said core for controlling the firing angle of the core and thus the average current through said gate winding.

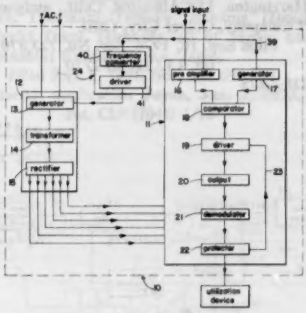
4,092,608

ELECTRONIC CIRCUITRY

Walter David Woods, 15469 Camarillo St., Sherman Oaks, Calif. 91403

Filed Jul. 28, 1976, Ser. No. 709,444
Int. Cl.[2] H03F *3/38*
U.S. Cl. 330—10 29 Claims

17. An integral amplifier comprising:
a switched-mode amplifier section having first oscillator means for generating a first signal having a first fixed frequency;
a switched-mode power-supply section having second oscillator means for generating a second signal having a second fixed frequency;



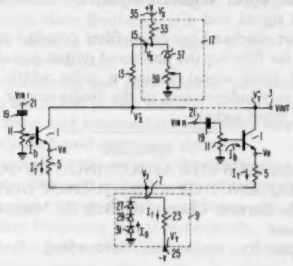
means for applying at least one output of said switched-mode power-supply section to said switched-mode amplifier section as at least one operating voltage thereof.

4,092,609

CIRCUIT FOR REDUCING RIPPLE VOLTAGE

Leonard Abraham Kaplan, Fords, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 14, 1976, Ser. No. 686,454
Int. Cl.[2] H03F *1/26*
U.S. Cl. 330—149 9 Claims



1. In combination:
a current control device having input, output and common electrodes and having a principal conduction path between its output and common electrodes, the current flow through which path is increased and decreased responsive to the potential between its common and input electrodes being increased and decreased, substantially independently of the potential between its common and output electrodes;
first and second resistances, each having a first end and a second end, the first ends of said first and said second resistances connected respectively to the common electrode of said current control device and to its output electrode;
means for applying an input signal potential, as referred to a reference voltage, to the input electrode of said current control device;
means responsive to a first supply voltage received at an input terminal thereof to apply a first operating potential from an output terminal thereof to the second end of said first resistance, and means responsive to a second supply voltage received at an input terminal thereof to apply a second operating potential from an output terminal thereof to the second end of said second resistance, said first and second operating voltages having respective

direct components respectively of a first polarity and of a second polarity as referred to said reference voltage for conditioning the principal conduction path of said current control device to conduct current, said first and second operating voltages having respective ripple components of opposite senses from each other and of predetermined proportions relative to each other; and

adjustment means, included in one of said means for applying first and second operating voltages, for adjusting the ripple component available from its output terminal thereby to substantially reduce the ripple component in the potential at the first end of said second resistance, as tends to accompany an output signal potential appearing there responsive to said input signal potential.

4,092,610

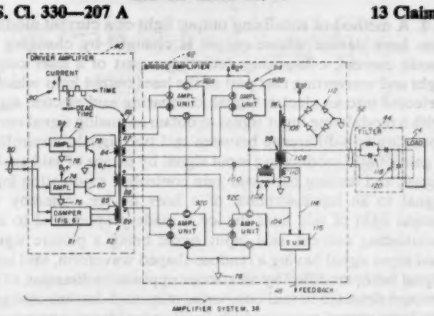
MODULATED CARRIER AMPLIFYING SYSTEM

Benjamin J. White, Middletown, R.I.; George Moreau, Westport, Mass., and Robert E. Dworkin, Middletown, R.I., assignors to Raytheon Company, Lexington, Mass.

Filed Feb. 17, 1977, Ser. No. 769,379

Int. Cl.² H03F *21/00*

U.S. Cl. 330—207 A **13 Claims**



13. In combination:

a plurality of amplifiers;

means for coupling said plurality of amplifiers to a load;

means for activating a first gorup of said amplifiers to provide a flow of power within said coupling means;

means responsive to said ativating means for terminating said flow of power in said first group of said amplifiers;

means responsive to said activating means for initiating a flow of power by a second group of said amplifiers subsequent to the termination of said flow of power of said first group of said amplifiers; and

means coupled between said activating means and a signal to be amplified by said amplifiers for modifying said signal, said modifying means including a delay circuit for imparting a delay between a trailing edge of a pulse of said signal and a leading edge of a second pulse of said signal to insure a delay between said terminating of power to said first group of said amplifiers and said initiating of power by said second group of said amplifiers.

4,092,611

ADAPTIVELY BIASED DIFFERENTIAL OPERATIONAL AMPLIFIER FOR PHOTO DIODE

Thomas M. Frederiksen; Robert S. Sleeth, both of San Jose, and William M. Howard, Campbell, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 6, 1977, Ser. No. 794,433

Int. Cl.² H03F *3/45*; G03B *7/00*

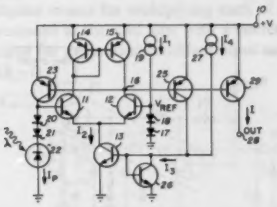
U.S. Cl. 330—261 **10 Claims**

1. A circuit for replicating the current produced by a photo diode in response to illumination, said circuit comprising:

a differential amplifier having inverting and noninverting inputs, an output, and tail current control means;

means for applying a reference potential to said inverting input;

means for coupling a first inverting amplifier between said output and said noninverting input; and



level shifting means coupled between said photo diode and said noninverting input, said level shifting means operative to produce a level shift of approximately said reference potential value whereby said photo diode is operated at substantially zero bias.

4,092,612

AMPLIFIER CIRCUITS

Otto Heinrich Schade, Jr., North Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

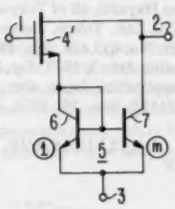
Continuation of Ser. No. 644,821, Dec. 29, 1975, abandoned.

This application May 12, 1977, Ser. No. 796,341

Claims priority, application United Kingdom, Feb. 24, 1975, 07659/75

Int. Cl.² H03F *3/04*

U.S. Cl. 330—288 **18 Claims**



17. An amplifier circuit comprising:

a current mirror amplifier having input and output and common terminals, said current mirror amplifier having an output circuit between its output and common terminals for connection to subsequent circuitry and exhibiting constant current gains between both its input and output terminals and its input and common terminals, and

a field-effect transistor of similar conductivity type to said current mirror amplifier, having a gate electrode for connection to preceding circuitry and having a channel with source and drain electrodes at opposite ends thereof respectively connected to the input and output terminals of said current mirror amplifier.

4,092,613

TRANSISTORIZED CLASS AB POWER AMPLIFIER AND ITS BIAS CIRCUIT

Albert Boubouleix, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Apr. 8, 1977, Ser. No. 785,787

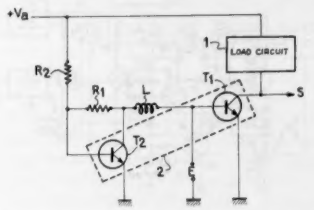
Claims priority, application France, Apr. 13, 1976, 76 10838

Int. Cl.² H03F *1/32*

U.S. Cl. 330—289 **2 Claims**

1. A class AB power amplifier comprising: an amplifier transistor designed to amplify an HF signal applied to its base, said amplifier transistor being connected in a common-emitter configuration at least as far as the bias is concerned, and having

an emitter, a base and a collector, the latter being coupled to a fixed potential point; and a base bias circuit for biasing said amplifier transistor, said circuit comprising a regulating transistor arranged in a common-emitter configuration, and having



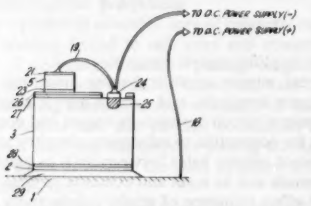
an emitter, a base and a collector, the latter being coupled to the base of said amplifier transistor, and first and second resistors connecting the base of said regulating transistor respectively to its collector and to said fixed potential point.

4,092,614

SEMICONDUCTOR LASER DEVICE EQUIPPED WITH A SILICON HEAT SINK

Isamu Sakuma; Hiroo Yonezu; Katsuhiko Nishida; Taibun Kamejima; Tonao Yuasa; Masayasu Ueno; Toshio Uji; Yasuo Nannichi, and Izuo Hayashi, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 613,428, Sep. 15, 1975, abandoned.
This application Jan. 7, 1977, Ser. No. 757,684
Claims priority, application Japan, Oct. 5, 1974, 49-121124; Oct. 5, 1974, 49-121123; Sep. 25, 1974, 49-115560; Sep. 21, 1974, 49-114616
Int. Cl.² H01S *3/19*
U.S. Cl. 331—94.5 P **8 Claims**



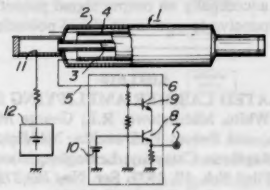
1. A semiconductor laser device comprising a semiconductor laser crystal body having a side face and which generates a laser beam and heat during operation, an electrically conductive silicon crystal body having a side face and two opposite main surfaces of a larger area than that of said semiconductor laser crystal body, first means for electrically and thermally connecting said semiconductor crystal body to one of said main surfaces of said silicon crystal body, thereby providing ohmic contact between said silicon crystal body and said semiconductor crystal body, a metal body having a main surface of a larger area than that of said silicon crystal body, and second means spaced from said first connecting means for electrically and thermally connecting the other of said main surfaces of said silicon crystal body to said main surface of said metal body, thereby providing ohmic contact between said silicon crystal body and said metal body, whereby an electrical conduction path is established from said metal body to said semiconductor crystal body through said silicon crystal body.

4,092,615

METHOD OF AND APPARATUS FOR STABILIZING OUTPUT LIGHT OF A CURRENT MODULATION LASER DEVICE WHOSE OUTPUT IS CHANGED BY CHANGING AN ANODE CURRENT

Akira Shimizu, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Continuation of Ser. No. 633,162, Nov. 18, 1975, abandoned.
This application Apr. 8, 1977, Ser. No. 786,049
Claims priority, application Japan, Nov. 25, 1974, 49-135391
Int. Cl.² H01S *3/13*
U.S. Cl. 331—94.5 S **2 Claims**



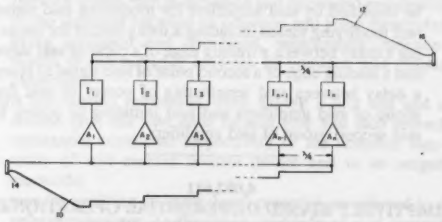
1. A method of stabilizing output light of a current modulation laser device whose output is changed by changing an anode current, comprising detecting a part of a laser output light and converting that part of the laser output light which is detected into an electric signal, comparing said electric signal with a modulating input signal to obtain an analog signal corresponding to a difference between said two signals, controlling a gain of said modulating input signal by means of said analog signal, and feeding back said gain controlled modulating input signal to an input terminal of a laser device, whereby the output light of said laser device is made proportional to said modulating current, said input signal being a picture signal, said input signal having a random-shaped waveform, said input signal being modified by an amount opposite in direction to the amount detected in said comparing step, said current changing the laser output monotonously, said output being correspondingly variable with said input signal.

4,092,616

TRAVELING WAVE POWER COMBINING APPARATUS

Johann Martin Osterwalder, San Diego, Calif., assignor to General Dynamics Corporation Electronics Division, San Diego, Calif.

Filed Nov. 22, 1976, Ser. No. 743,921
Int. Cl.² H03F *3/60, 3/68;* H03B *0/00;* H01P *5/12*
U.S. Cl. 333—6 **13 Claims**



1. A solid state traveling wave power combining apparatus for use in a microwave transmission system for transmitting a signal of a given wave-length comprising a distributed amplifier characterized by:

an input transmission line having an input terminal at one end for connection to a signal source;

an output transmission line having an output terminal at one end for connection to a load; and

a plurality of amplifiers connected between the input and

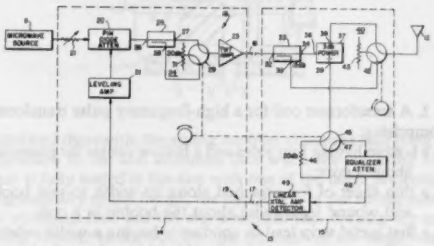
output transmission lines at quarter wavelength intervals with the amplifier that is connected closest to the input terminal being the amplifier that is connected most distant from the output terminal, thereby providing a phase relationship between the traveling waves placed on the output transmission line from the amplifiers such that the waves placed on the output transmission line by the amplifiers in the direction toward the output terminal are in phase with each other and thus are added, and that the waves placed on the output transmission line by adjacent amplifiers in the direction away from the output terminal are 180° out of phase with each other and thus cancel each other.

4,092,617

WIDE POWER RANGE MICROWAVE FEEDBACK CONTROLLER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Leo E. Titus, Torrance, Calif.

Filed Mar. 29, 1977, Ser. No. 782,480
Int. Cl.² H03H 1/04
U.S. Cl. 333—17 R **10 Claims**



7. Apparatus for deriving a substantially constant power level in each of a plurality of relatively widely spaced power ranges from a microwave load, the apparatus being responsive to a microwave source of substantially constant amplitude, comprising a forward path between the source and load, said forward path including a voltage controlled variable microwave gain device, a feedback path responsive to the microwave power level in the forward path for deriving a control voltage for the variable gain device, said feedback path including a microwave device having an amplitude detector with a desired input-output response over a relatively narrow amplitude range of inputs to it so that the input to the detector should be maintained in the narrow range over all of the plural power ranges, and attenuating means selectively connected in the feedback and forward paths for varying the power range supplied to the load while maintaining the power level of the microwave input to the detector substantially constant.

4,092,618

DISCRETE TRANSVERSAL FILTER

Loic Bernard Yves Guidoux, Le Plessis Robinson, France, assignor to Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

Filed Dec. 8, 1976, Ser. No. 748,698
Claims priority, application France, Dec. 22, 1975, 75 39295
Int. Cl.² H03H 7/10, 5/00
U.S. Cl. 333—70 T **2 Claims**

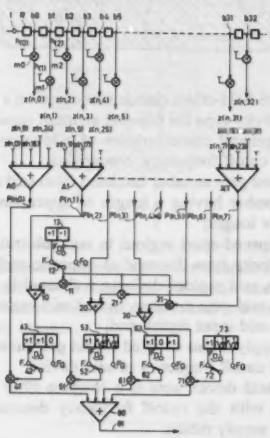
1. A discrete transversal filter having a giving cut-off frequency for processing input samples $x(n)$ and for generating output samples $y(n)$ which occur with a predetermined output sampling frequency f_s which is equal to an integral multiple of said cut-off frequency, which discrete filter has a predetermined lowpass transfer characteristic which is related to the transfer characteristic of a predetermined lowpass filter with impulse response $h_1(i)$, said discrete filter comprising:

an input for receiving the input samples $x(n)$;

a tapped delay line for storing and producing N input samples $x(n)$ wherein the delay time of the delay line situated between each two successive taps is equal to $1/f_s$;

first storage means for storing and producing filter coefficients $h_1(i)$;

first multiplier means for multiplying each of the input samples produced at the said taps with a corresponding filter coefficient for generating modified input samples $z(n,i) = h_1(i) \cdot x(n-i)$;



first adder means;

first means for coupling the input circuit of the first adder means to the output circuit of the first multiplying means;

the first coupling means comprising:

second adder means which are coupled to said first multiplying means for generating sum values $P(n,r)$ which are each related to the modified input samples $z(n,i)$ according to the expression

$$P(n,r) = \sum_{k=0}^{[(N-1-r)f_s/f_s]} z(n, r + kf_s/f_s)$$

where

$r = 0, 1, 2 \ldots,$

$$(\frac{f_s}{f_s} - 1)$$

second multiplying means;

second coupling means for coupling the output circuit of the second adder means to the input circuit of the second multiplying means;

means for producing a first, a second and a third set of coefficients $\{a(1,r)\}$, $\{a(2,r)\}$, $\{a(3,r)\}$, of which first set of coefficients $\{a(1,r)\}$, the elements $a(1,r)$ are given by $a(1,r) = 1$, of which second set of coefficients $\{a(2,r)\}$ the elements $a(2,r)$ are given by $a(2,r) = \cos(2\pi r f_s/f_s)$, of which third set of coefficients $\{a(3,r)\}$ the elements $a(3,r)$ are given by $a(3,r) = \sin(2\pi r f_s/f_s)$;

means for selectively applying the first, the second and the third set of coefficients $\{a(q,r)\}$ to the second multiplying means;

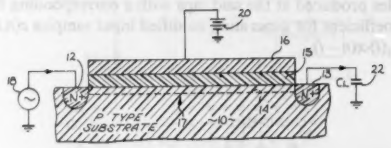
third coupling means for coupling the output circuit of the second multiplying means to the input circuit of the first adder means.

4,092,619

MOS VOLTAGE CONTROLLED LOWPASS FILTER

John M. Huggins, San Jose, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Dec. 27, 1976, Ser. No. 754,120
Int. Cl.[2] H03H 7/10; H01L 29/78
U.S. Cl. 333—70 R 12 Claims



1. An MOS field-effect device fabricated on a substrate of a first conductivity type for filtering an input signal, said device having the general characteristics of a lowpass filter with a controllable cutoff frequency, comprising:

an elongated gate member insulated from said substrate, said gate member having a length of approximately 500 microns, or longer;

a pair of spaced-apart regions in said substrate of a second conductivity type disposed at opposite ends of said gate member, said regions defining a channel in said substrate beneath said gate member, one of said regions coupled to receive said input signal; and,

voltage supply means coupled to said gate member for defining said cutoff frequency of said device;

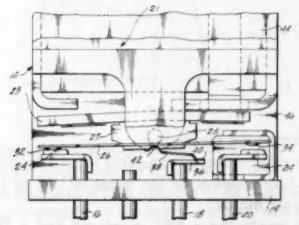
whereby said device acts as a lowpass filter between said regions with the cutoff frequency determined by said voltage supply means.

4,092,620

ELECTRICAL CONNECTION FOR THE MOVING CONTACTS OF A RELAY

John C. Schuessler, West Covina, and David J. Tapp, Manhattan Beach, both of Calif., assignors to Leach Corporation, Los Angeles, Calif.

Filed Mar. 22, 1976, Ser. No. 669,213
Int. Cl.[2] H01H 67/02
U.S. Cl. 335—128 1 Claim



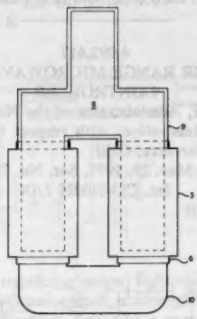
1. In a relay having moving contacts supported on a pivoted contact blade actuated by the relay, apparatus for completing an electrical circuit to the contact blade, comprising a header having at least one connector pin extending therethrough, and means including a cantilever spring contact attached at one end to the contact pin and supported thereby, the cantilevered spring contact extending substantially parallel to the contact blade, the free end of the spring having a curved projecting portion pressing against the surface of the contact blade, the curved projecting portion engaging the contact blade adjacent the pivot axis of the contact blade.

4,092,621

THIN FOIL PULSE TRANSFORMER COIL FOR REDUCING DISTRIBUTED AND LEAKAGE INDUCTANCE

Reuben E. Nyswander, China Lake, and Paul E. Stewart, Ridgecrest, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 18, 1976, Ser. No. 743,428
Int. Cl.[2] H01F 27/28
U.S. Cl. 336—184 3 Claims



1. A transformer coil for a high-frequency pulse transformer comprising;

a bobbin having four sides and a hollow center for placement about a core;

a thin sheet of foil attached along its width to said bobbin and wound lengthwise about the bobbin in a coil;

a first metal strip lead-in conductor having a width substantially covering one side of said bobbin and attached to said foil along the entire width of said foil on the inner end of said coil adjacent to said bobbin, said first metal strip extending lengthwise in a single direction beyond said coil adjacent to one side of said bobbin;

a sheet of insulating material disposed between turns of said coil and extending beyond the edges thereof so as to provide insulation between turns;

a second lead-in conductor attached to said foil along the entire width of said foil on the outer end of said coil and extending lengthwise beyond said coil in a single axial direction so as to form a region where said first lead-in and said second lead-in extend beyond the coil and are parallel and extending in width across a substantial portion of one side of the bobbin; and

a layer of dielectric material sandwiched in said region between said first lead-in connector and said second lead-in connector so as to form a stripline connector to said coil and extending axially from one end thereof to facilitate assembly of said coil in a pulse transformer.

4,092,622

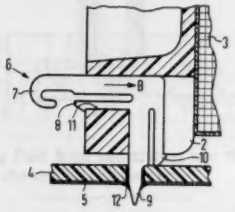
COIL BODY

Rudolf Widemann, Neubiberg, and Roland Ehrgott, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 8, 1977, Ser. No. 785,733
Claims priority, application Germany, Apr. 21, 1976, 2617466
Int. Cl.[2] H01F 15/10
U.S. Cl. 336—192 3 Claims

1. An electronic coil for use in printed circuits having a coil body provided with longitudinal end flanges and an intermediate coil area, said flanges having longitudinal outer peripheral corners, a soldering element insertion slot through at least one flange adjacent the corner thereof, the slot being substantially right angled and open to adjacent end face and side face of the

flange, the flange having a coil area inside face, the slot open to the inside face whereby a soldering element can be inserted into the slot from the inside face, the slot having a rectangular cross section, a soldering element received in the slot, the soldering element having two free ended tangs projecting at right angles from one another with one of the ends providing an attachment pin for attachment to the printed circuit and the other of the ends providing a soldering lug for attachment to an end of a coil wire wrapped on said coil body within the coil area, each of the tangs being substantially rectangular in cross section having flat side faces being dimensioned to be received within the slot with the side faces in opposition to side walls of the slot restricting rotation of the tang within the slot, each of the tangs having an integral spring member associated therewith, the spring member being compressible during insertion of the soldering element into the slot, the spring member having an abutment face thereon, the slot having an abutment face



associated therewith, the spring member abutment face lying in opposition to the slot abutment face when the soldering element is fully seated in the slot with one of the tangs projecting longitudinally of the flange, the opposition of the spring member abutment face and the slot abutment face locking the soldering element in the slot, the slot and each of the tangs being dimensioned with respect to one another such that either tang is insertable into the slot projecting longitudinally of the coil body whereby the soldering element can be selectively inserted into the slot with a selected one of the attachment pin ended tang and soldering lug ended tang projecting longitudinally of the coil body with the other one of said tangs projecting transversely of the longitudinal direction of the coil body, the longitudinally projecting tang associated spring member snapping into spring member abutting face opposition to the slot abutment face upon full insertion of the longitudinally projecting tang into a longitudinally extending portion of the slot.

4,092,623

CIRCUIT BREAKER

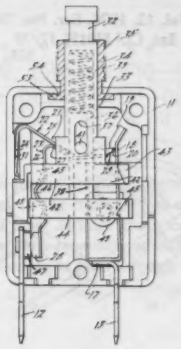
Joseph F. Kirkup, Parma, Mich., assignor to Mechanical Products, Jackson, Mich.

Filed Jul. 21, 1976, Ser. No. 707,240

Int. Cl.[2] H01H *71/16*

U.S. Cl. 337—66 **3 Claims**

1. A circuit breaker comprising a case molded from insulating material, spaced terminals extending through the case to the interior thereof, a contact on the inner end of one of said terminals, a bimetallic element having one end attached to the inner end of the other terminal, a latching contact on the opposite end of said bimetallic element, and a unitary resilient conductive bridging member comprising a mounting arm and two contact arms angularly related to one another, one of said contact arms having a pressure contact on the end thereof, the other of said contact arms having a latchable contact at the end thereof, said pressure and latchable contacts being engageable and latchable with the contacts on said one terminal and said bimetallic element, respectively, the mounting arm of said bridging member having an end portion rigidly mounted in said case, said bridging member being self-biased for rotation in one direction to maintain contact pressure between the latchable contact on said other contact arm and the latching contact on said bimetallic element when said circuit breaker is in the closed condition, said one contact arm having a self-bias to maintain contact pressure between the pressure contact thereon and the contact on said one terminal, the self-bias of said mounting arm effecting separation of the pressure and



latchable contacts on said one and other contact arms from the contacts on said one terminal and bimetallic element, respectively, upon the occurrence of an overload in a circuit containing said circuit breaker.

4,092,624

THERMOSTAT ASSEMBLY

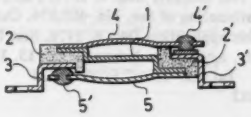
Uchiya Tomoyoshi, Misato, Japan, assignor to Uchiya Co., Ltd., Japan

Filed Aug. 16, 1976, Ser. No. 714,399

Claims priority, application Japan, Aug. 15, 1975, 50-112947[U]; Aug. 15, 1975, 50-112948[U]; Aug. 15, 1975, 50-112949[U]

Int. Cl.[2] H01H *37/52*

U.S. Cl. 337—340 **4 Claims**

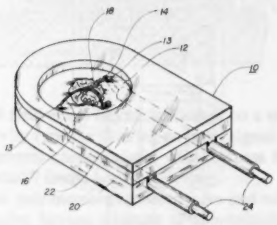


1. A thermostat assembly comprising a stepped frame, two insulating members which are respectively secured to a lower surface of one end part of said frame and an upper surface of the other end part, terminal fixtures which are respectively secured to a lower surface of one of said insulating members and an upper surface of the other insulating member, and two contact arms which are respectively disposed on an upper surface and a lower surface of said frame in a manner to confront each other and to extend in directions opposite to each other, said contact arm arranged on said upper surface of said frame having its base part secured to the upper surface of said one end part of said frame and having its contact held in contact with an upper surface of one of said terminal fixtures, said contact arm arranged on said lower surface of said frame having its base part secured to the lower surface of said other end part of said frame and having its contact held in contact with a lower surface of the other terminal fixture.

4,092,625
SINGLE USE MONITORS FOR AUTOMATIC SAFETY CONTROLS OF ELECTRICALLY ENERGIZED APPARATUS

C. Fred Newsom, Kenner, La., assignor to Tattle-Tale, Inc., New Orleans, La.

Filed Jul. 12, 1976, Ser. No. 704,865
Int. Cl.[2] H01H *37/76*
U.S. Cl. 337—405 2 Claims



1. In an electrically energized apparatus, having a normally closed safety switch connected in series in an energizing circuit thereto and automatically operable by a sensing element adapted to sense a malfunction in a part of said apparatus, a single-use monitor for indicating an opening of said safety switch by said sensing element and comprising in combination:

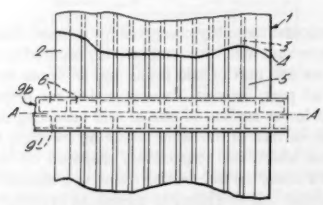
a. high resistance heating means connected in parallel with said normally closed safety switch for breaking said energizing circuit when said safety switch is opened, and remaining connected in parallel in said energizing circuit when said safety switch remains normally closed.

b. case means enclosing said high resistance electrical heating means and being adapted to visually display evidence of the breaking of said energizing circuit, for indicating a malfunction had occurred at the site of said sensing element.

4,092,626
CONTINUOUS WEB CONSISTING OF RESISTANCE FOIL MATERIAL BETWEEN TWO INSULATING FOIL LAYERS AND METHOD FOR THE PRODUCTION OF SUCH WEBS

Hans Amund Bergersen, Oslo, Norway, assignor to Patentkonsortiet Robert Meinich & Co., Oslo, Norway

Division of Ser. No. 602,189, Aug. 6, 1975, Pat. No. 4,025,893, which is a continuation of Ser. No. 405,076, Oct. 10, 1973, abandoned. This application Dec. 6, 1976, Ser. No. 747,641
Claims priority, application Norway, Oct. 13, 1972, 3688/72
Int. Cl.[2] H01C *3/06, 17/28*
U.S. Cl. 338—212 7 Claims

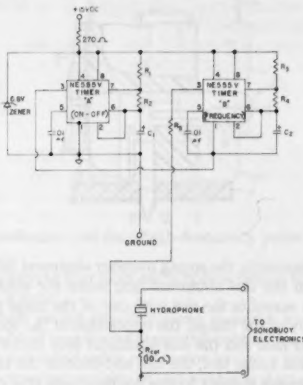


1. In a flexible composite web of longitudinally extending and transversely spaced resistance foil strips positioned between insulating layers and in which said resistance foil strips are connected into a meander resistance path by a row of short conductive pieces, the improvement wherein said row of short conductive pieces comprises a non-conductive carrier strip, at least one row of spaced conductive flat foil tabs carried by said carrier strip and facing the resistance foil strips and making electrical contact therewith, said conductive flat foil tabs each connecting the strips of adjacent resistance foil strips.

4,092,627
CALIBRATION CIRCUIT FOR EXPENDABLE SONOBUOYS

Donald Murdock, and Thomas E. Stixrud, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 30, 1976, Ser. No. 755,710
Int. Cl.[2] H04B *11/00;* H04R *29/00*
U.S. Cl. 340—2 3 Claims



1. In an expendable sonobuoy having a hydrophone coupled to an electronics package an improved in-situ calibrator is provided comprising:

means for initiating a series of on-off duty cycles; and

means coupled to the initiating means for generating spectrally distributed calibrate signals of predetermined frequencies and amplitudes when the initiating means is in the on portion of the duty cycle and for coupling the known calibrate signals of predetermined frequencies and amplitudes to a small resistor in series with the hydrophone to enable a verification of the entire system operation.

4,092,628
SEISMIC TRANSDUCER UNIT FOR MARSHY TERRAINS

Ernest M. Hall, Jr., Houston, Tex., assignor to Western Geophysical Co. of America, Houston, Tex.

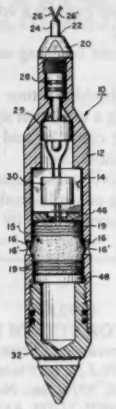
Filed Jul. 12, 1976, Ser. No. 704,148
Int. Cl.[2] G01V *1/00;* H04B *13/00;* H04R *15/00*
U.S. Cl. 340—10 1 Claim

1. In a seismic transducer unit for detecting pressure variations in a surrounding fluid medium, said transducer unit including a hollow, rigid casing having an inner bore and defining in its wall at least one sound-transmitting window and a conical bottom end cap detachably coupled to said casing, the improvement comprising:

a hydrophone assembly removably disposed inside said bore, said hydrophone assembly including an elastomer core and a crystal assembly embedded in said core, said core serving to transmit sound waves to the crystal assembly; and

means for adjustably compressing said core so that portions

of said core expand radially outwardly, effecting sealing engagement against the wall of said bore, and blocking the



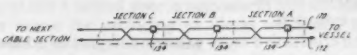
surrounding fluid from penetrating into the bore of said casing past the sealing engagement.

4,092,629

DECENTRALIZED SEISMIC DATA PROCESSING SYSTEM

Lee E. Siems; Paul M. Morgan, and Carl H. Savit, all of Houston, Tex., assignors to Western Geophysical Co. of America, Houston, Tex.

Filed Mar. 8, 1976, Ser. No. 664,618
Int. Cl.[2] G01V *1/22*
U.S. Cl. 340—15.5 TS **15 Claims**



1. A two-stage multiplexing seismic exploration and telemetry system comprising:

a seismic cable including a broadband transmission link;

a plurality of transceiver units spaced along said cable;

a plurality of seismic sensor units having outputs into each of said transceiver units;

remote control means for multiplexing signals from desired ones of said transceiver unit onto said broadband transmission link; and

remote control means for successively connecting selected seismic sensor units to the associated transceiver unit, whereby the output representative of the amplitude and polarity of the signal from each selected seismic sensor unit is sampled and applied to said transmission link.

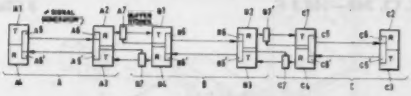
4,092,630

SYSTEM FOR ERROR CONTROL AND PHASING IN INTERCONNECTED ARQ-CIRCUITS

Hendrik Cornelis Anthony van Duuren, Wassenaar, and Herman da Silva, Voorburg, both of Netherlands, assignors to De Staat der Nederlanden, te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie, The Hague, Netherlands

Filed Oct. 15, 1976, Ser. No. 732,995
Claims priority, application Netherlands, Oct. 17, 1975, 7512209
Int. Cl.[2] G08C *25/00*; H04L *1/10*; G06F *11/00*
U.S. Cl. 340—146.1 BA **8 Claims**

1. System for error control and phasing in a series of interconnected ARQ-circuits; the durations of the repetition cycles of each ARQ-circuits, as compared to one another, being not equal, said system comprising: means provided at a connection point capable of storing a number of signals related to the propagation time of a circuit located before the connection point, when a circuit located behind the connection point goes



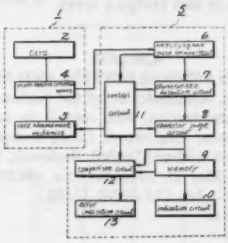
through a repetition procedure; and means to deliver special signals not belonging to the traffic to the circuits located behind the connection point and not going through a repetition procedure to prevent their repetition when the first said circuit behind said connection point goes through a repetition procedure.

4,092,631

PATTERN RECOGNITION SYSTEMS

Chuji Suzuki, Nara; Syoichi Yasuda, and Yoshiki Nishioka, both of Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 465,487, Apr. 30, 1974, abandoned.
This application Aug. 20, 1976, Ser. No. 716,347
Int. Cl.[2] G06K *9/06*
U.S. Cl. 340—146.3 J **6 Claims**



1. A character recognition method for scanning, reading and recognizing normalized characters consisting essentially of vertical and horizontal lines marked on a record medium, and in which the scanning cycle consists of consecutive optical scannings in a vertical direction of the field covered by a normalized character until the whole of a normalized character has also been scanned in a horizontal direction, comprising the steps of:

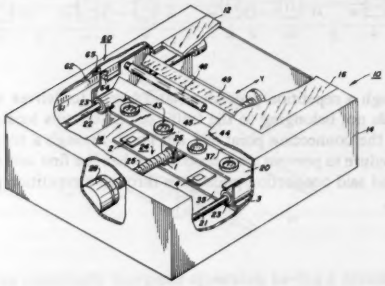
detecting specific vertical characteristics contained in the characters by the use of waveforms of specified characteristics synthesized from the signals obtained by a single scanning cycle in a vertical direction, and detecting the number of vertical scanning cycles in which said specified characteristics exist during the totality of the consecutive vertical scannings, said number being indicative of character characteristics in a horizontal direction, thereby detecting the two-dimensional characteristics contained in the characters.

4,092,632

CROSSOVER ARRANGEMENT FOR MULTIPLE SCANNING ARRAYS

Martin A. Agulnek, Brighton, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 2, 1977, Ser. No. 793,025
Int. Cl.[2] G06K *9/00*
U.S. Cl. 340—146.3 F **3 Claims**



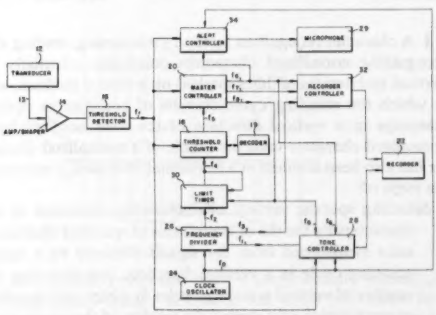
1. In an apparatus for scanning an image, the combination of:
a. a movable scanning carriage;
b. at least two relatively long linear arrays on said carriage, said arrays being disposed in end to end relationship and extending in a direction substantially perpendicular to the direction of scanning movement of said carriage; and
c. a relatively short linear bridging array on said carriage, said bridging array being disposed to overlap adjoining ends of said relatively long arrays whereby to form in cooperation with said relatively long arrays an uninterrupted composite array for scanning said image, each of said arrays being comprised of a plurality of photosensitive elements arranged in succession to form a unitary multi-photosensitive element array, the number of photosensitive elements in said relatively long linear arrays being substantially greater than the number of photosensitive elements in said bridging array.

4,092,633

CONDITION SENSOR SYSTEM AND METHOD

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of John T. Polhemus, Englewood, Colo.; Joseph E. Morgan, Friendswood, and Arthur Mandell, Seabrook, both of Tex.

Filed May 21, 1976, Ser. No. 688,856
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—213 R **8 Claims**



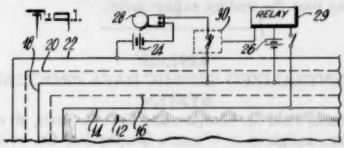
1. A sensor system for monitoring a variable condition, comprising:
a sensor coupled to the condition for producing a condition pulse whenever a parameter of the condition exceeds a threshold level, said sensor being coupled to a signal conditioner including a one-shot multi-vibrator and said multi-vibrator producing said pulse when the output of said signal conditioner exceeds a voltage corresponding to said threshold level;
a resettable limit counter counting each pulse produced by the sensor,
a resettable timer establishing a time frame;
said counter producing a condition signal whenever, within said time frame, the count by said counter is equal to or greater than a threshold count;
control means responsive to said pulses and to said condition signal for producing control signals; and
a utilization network controllable by said control signals.

4,092,634

ELECTRIC INDICATOR SYSTEM FOR BALL GAMES

Henry Von Kohorn, Greenwich, Conn., assignor to John J. Schlager, Springfield, N.J., a part interest

Filed Oct. 6, 1976, Ser. No. 729,996
Int. Cl.[2] G08B *21/00*; A63C *19/06*
U.S. Cl. 340—323 R **9 Claims**



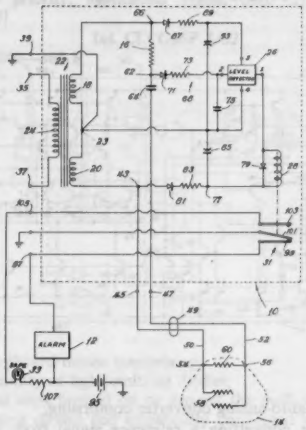
1. In an electric out ball indicating system for tennis courts on which a tennis ball has a tendency to skid, an open circuit comprising
(a) a power source,
(b) an indicator,
(c) non-conductive tapes exterior and parallel to the tennis court boundary lines each tape having at least two electric leads comprised of separated, exposed, conductive bands on its upper surface,
(d) connecting means between said power source, indicator and conductive bands,
wherein said electric leads are so spaced apart that an "out" tennis ball provided with current-conductive surface fibers will be capable of touching two of said electric leads to thereby close said open circuit and activate said indicator, said system further comprising
(e) an open circuit comprising a power source and non-conductive tapes generally coinciding at least in part with the tennis court boundary lines, said tapes having at least two electric leads comprised of separated, exposed, conductive bands on their upper surfaces wherein one of said electric leads coincides with a portion of the tennis court boundary lines, said electric leads being so spaced apart that said tennis ball, flattened upon impact, will be capable of touching two of said electric leads,
(f) electric means between said power source, indicator and conductive bands forming said open circuit of (e) to interrupt the flow of electric current to said indicator of (b) or to render said electric indicator inoperative, when said ball provided with current conductive surface fibers closes said open circuit of (e) by making contact between the electric leads on the upper surface of said tapes described in (e),
whereby an "in-play" ball touching a tennis court boundary line will deactivate said indicator to thereby avoid an erroneous "out-ball" indication caused by skidding of said ball into contact with the electric leads of (c).

4,092,635

HUMIDITY SENSOR ALARM UNIT

Roger M. Warner, Bethesda, Md., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Sep. 20, 1976, Ser. No. 724,811
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—235 4 Claims



1. A fail-safe humidity sensing alarm apparatus, which comprises:

an electric humidity sensor for detecting changes in humidity and having a resistance which varies in response to humidity variations;

a level detector for detecting a substantially null condition and for providing a first signal when said substantially null condition is detected and a second signal when other than a substantially null condition is detected;

a bi-stable device having a first state in response to said first signal and a second state in response to said second signal;

alarm means for providing an alarm when said bi-stable device is in said second state; and

circuit means for providing to said level detector (a) a substantially null condition when said humidity sensor detects a relative humidity which is below a predetermined threshold, (b) other than a substantially null condition when said humidity sensor detects a relative humidity which exceeds the predetermined threshold, (c) other than a substantially null condition when said humidity sensor is short-circuited, and (d) other than a substantially null condition when said humidity sensor is open-circuited.

4,092,636

PROTECTIVE ALARM SYSTEM FOR WINDOW USING REFLECTED MICROWAVE ENERGY

Mark Shepherd, Jr., Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

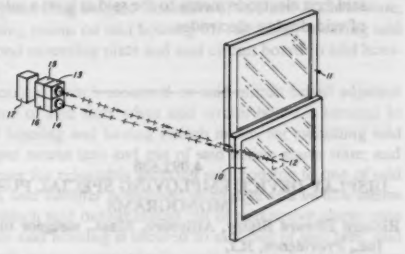
Continuation of Ser. No. 705,205, Jul. 14, 1976, abandoned, which is a continuation of Ser. No. 508,949, Sep. 24, 1974, abandoned, which is a continuation of Ser. No. 320,403, Jan. 2, 1973, abandoned. This application Jul. 5, 1977, Ser. No. 813,155
Int. Cl.[2] G08B *13/08, 13/04*
U.S. Cl. 340—274 R 1 Claim

1. A protective alarm system for a transparent window for which movement or destruction is to be detected, comprising:

(a) generator means positioned on a wall opposite the window for generating a continuous beam of microwave energy and directing the beam toward the window;

(b) a thin, flat, mirror like device positioned on and adjesively attached to the window for reflecting the beam directionally;

(c) detector means positioned adjacent the generator means to receive the reflected beam and effective to generate an electrical signal indicative of the presence or absence of the reflected beam, the generator means and the detector means comprising a microwave integrated circuit module, the detector means and the generator means being positioned along a line-of-signt substantially normal to a surface of the window; and



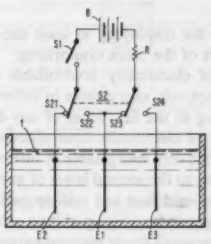
(d) indicator means coupled to the detector means and responsive to the signal to produce an indication of the absence of the reflected beam.

4,092,637

LIQUID ELECTROLYTE TYPE ELECTROCHROMIC DISPLAY DEVICE

Donald John Barclay, Winchester; Colin Leonard Bird, Fair Oak, Eastleigh; Michael Henry Hallett, Chandlers Ford; David Horrobin Kirkman, West Moors; John Francis Minshull, Winchester, and Charles Edward Owen, Chandlers Ford, all of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 5, 1976, Ser. No. 683,455
Claims priority, application United Kingdon, Sep. 30, 1975, 39872/75
Int. Cl.[2] G09F *9/32*
U.S. Cl. 340—324 R 11 Claims



1. An electrochromic display device comprising:

liquid electrolyte means,

first and second electrode means immersed in said liquid electrolyte means,

said first and second electrode means and said liquid electrolyte means being such that electric current between said first and second electrode means causes a color absorbing species to be deposited on one of said first and second electrode means and causes another species to be deposited on the other of said first and second electrode means,

a plurality of display electrodes also immersed in said liquid electrolyte means,

first drive means selectively operable first to generate a potential difference between said first and second elec-

trode means so that the said species is deposited on said first electrode means, and

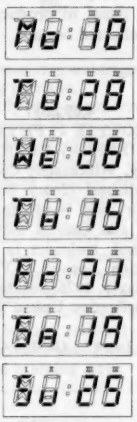
second drive means selectively operable subsequently to generate a potential difference between said first electrode means and at least a selected one of said display electrodes such that the color absorbing species is transferred from said first electrode means to the said at least a selected one of said display electrodes.

4,092,638

DISPLAY DEVICE EMPLOYING SPECIAL PURPOSE MONOGRAMS

Richard Edward Ripley, Attleboro, Mass., assignor to Textron Inc., Providence, R.I.

Filed Mar. 11, 1977, Ser. No. 776,717
Int. Cl.[2] G09F *9/32*
U.S. Cl. 340—336 **6 Claims**



1. In a device for displaying at least the first and second letters of the days of the week comprising:

a first array of electrically controllable elongate display elements selectively energizable in different combinations corresponding to the first letter of any day of the week,

a second array of electrically controllable elongate display elements selectively energizable in different combinations corresponding to the second letter of any day of the week,

said elements of said first and said second arrays including six linear elements forming an oblong substantially upright frame and a seventh linear element extending horizontally across said frame to divide it into an upper and lower half, and

said first array further including two V-shaped elements disposed in said halves in mutually inverted relationship with vertices pointing toward said seventh element,

the improvement comprising,

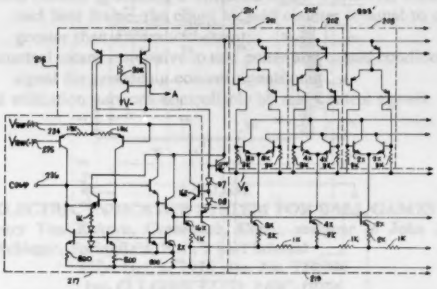
an eight linear display element in said second array extending laterally between the linear elements which form the sides of the lower half of said second array to divide it into two substantially equal parts, whereby the first letters of the days of the week may be formed as uppercase letters, the second letters of some days of the week may be about one-half as high as the first letters of the days of the week and the second letter of at least one day of the week may be formed as a lowercase letter by selectively energizing the display elements of said first and second arrays.

4,092,639

DIGITAL TO ANALOG CONVERTER WITH COMPLEMENTARY TRUE CURRENT OUTPUTS

John A. Schoeff, Los Gatos, Calif., assignor to Precision Monolithics, Inc., Santa Clara, Calif.

Filed Jan. 6, 1976, Ser. No. 646,766
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 DA **30 Claims**



1. A digital-to-analog converter comprising,

means for converting a reference signal from a voltage reference signal to a current reference signal,

an electrical n-bit weighting network means for receiving said converter reference signal and for decrementing said reference signal into *n* weighted signal segments corresponding to a weighted *n*-bit order, said weighted network having *n* ports, each port for communicating one of said *n* weighted signal segments,

a plurality of *n* parallel transistor switching cells connected for receiving a binary input word of *n*-bit length wherein one of said bits operates as a logic control for a corresponding switching cell, each of said switching cells comprising,

(a) a balanced transistor input means having two branches operated by switch current supplied from a source, said branches receiving said logic control bit and a threshold adjustment voltage, and for switching switch current alternately between one of said two branches and the other, in response to said logic control bit, and

(b) a balanced transistor output means having two branches, each branch connected to a corresponding branch of input means, for communicating steering current to a load associated with each branch of the output means depending upon the existence of switch current in the corresponding branch of the input menas, said steering current from each of said switching cells continuously supplied to ports of said *n*-bit weighting network through electrical connections therewith for enabling weighted signal segments in said output load with said logic control bits,

a pair of output summing line means, each summing line means adapted for connection to a load and for receiving an amount of steering current from each switching cell corresponding to a decremented signal segment from said weighting network, and summing said steering current in each summing line, thereby forming a first current output in one output summing line and another current output complementary in amplitude to said first current output in the other output summing line, and

a plurality of bias circuits, each connected to said transistor switching cells and each including means for stabilizing switching action of said switching cells thereby enabling true current outputs.

4,092,640
KEY INPUT MEANS HAVING A SWITCHING ELEMENT MADE OF A LIGHT EMITTING DIODE

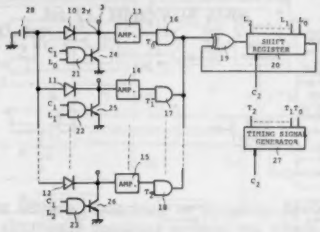
Masaharu Satoh, Minoo, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 27, 1976, Ser. No. 726,557

Claims priority, application Japan, Sep. 27, 1975, 50-132123[U]

Int. Cl.² G06F *3/02*

U.S. Cl. 340—365 R **9 Claims**



8. A keyboard means comprising:

a. a plurality of light emitting diodes;

b. metal caps formed on or around the each of said light emitting diodes and electrically connected with the respective cathode terminals of the light emitting diodes;

c. detection means connected to the respective cathode terminals of the light emitting diodes for developing detection signals when the operator touches the metal caps formed on or around the light emitting diodes; and

d. driving means for activating the corresponding light emitting diodes in response to the detection signals derived from the detection means.

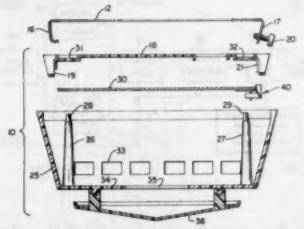
4,092,641
SECURITY INTERLOCK SWITCH SYSTEM FOR SMOKE DETECTORS AND THE LIKE

Thomas A. Bellinghausen, Lakewood, and Gareld I. Gilman, Indian Hills, both of Colo., assignors to Statitrol Corporation, Lakewood, Colo.

Filed Jul. 6, 1976, Ser. No. 703,059

Int. Cl.² G08B *29/00*

U.S. Cl. 340—409 **5 Claims**



1. In a smoke detecting device for indicating an active alarm state, said device adapted to be mounted to a flat surface such as a wall, ceiling or the like, the improvement comprising:

a first mounting plate adapted to be secured in abutting relation to said flat surface, said first mounting plate having a plurality of mounting tabs projecting outwardly from said flat surface when said first mounting plate is secured thereto;

a generally cup-shaped housing adapted to be releasably secured to said first mounting plate to define an enclosed chamber therebetween;

a second mounting plate having a plurality of slots positioned to be aligned with said mounting tabs, said second mounting plate dimensioned to be mounted within said housing;

a circuit board disposed within said enclosed chamber adjacent to said second mounting plate on a side opposite said first mounting plate and having electrical output means for generating a signal indicative of said active alarm state;

mounting means on said housing for releasably securing said second mounting plate and said circuit board to said housing;

an electrical switch mounted on said circuit board adjacent to one of said slots when said circuit board is secured to said housing and having switch means for switching said output means into and out of said active alarm state; and

a fastener for releasably securing said housing to one of said tabs, said fastener positioned to engage said switch means to switch said output means out of said active alarm state when said housing is secured to said one of said tabs, said switch means automatically switching said output means into said active alarm state when said fastener is moved out of engagement with said switch means.

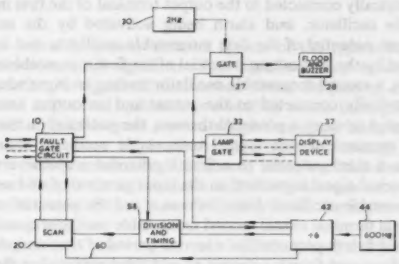
4,092,642
PLURAL SENSOR MONITORING AND DISPLAY DEVICE

Douglas Harry Green, Blackpool, and Joseph Pickup, Cleveleys, both of England, assignors to Delphic Limited, Douglas, England

Filed Oct. 22, 1976, Ser. No. 734,880

Int. Cl.² G08B *19/00*

U.S. Cl. 340—413 **14 Claims**



1. In a monitoring device for monitoring the outputs of a plurality of sensors and displaying appropriate information, said device comprising:

a plurality of input gate circuits for connection to the plurality of sensors;

scanning means operatively coupled to said input gate circuits and adapted to sequentially scan said input gate circuits to detect the presence of any activated sensor and to open any scanned gate which has an input signal during the period it is being scanned;

a plurality of display devices for sequentially displaying information corresponding to any activated sensor, said display devices including lamps controlled by respective lamp gate circuits;

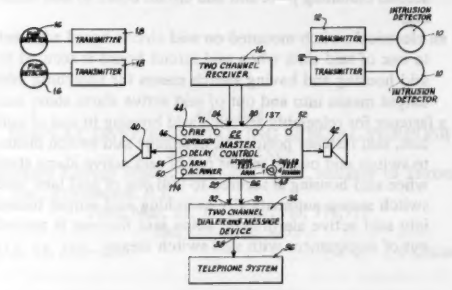
a timing circuit for controlling the display time of the display devices; the improvement comprising

an integrity circuit operatively coupled to said input gate circuits and to said display devices and adapted to inhibit the actuation of all of the display devices for a predetermined period following detection of an activated sensor.

4,092,643
SECURITY DEVICE

Larry G. Stolarczyk, Raton, N. Mex., assignor to A. R. F. Products, Inc., Raton, N. Mex.

Filed Apr. 25, 1975, Ser. No. 571,585
Int. Cl.[2] G08B 1/08, 19/00
U.S. Cl. 340—416 14 Claims



1. A security device comprising in combination, a first monostable oscillator having an input terminal and an output terminal adapted to carry a potential thereon, the potential on the output terminal of the first monostable oscillator changing from a first potential to a second potential responsive to an electrical signal impressed on the input terminal of said first monostable oscillator and the output of said first monostable oscillator remaining at said second potential for a first period of time following each change to said second potential and returning to said first potential at the end of said first period of time, a sensor adapted to produce an electrical signal for actuating the first monostable oscillator electrically connected to the input terminal of said first monostable oscillator, an alarm electrically connected to the output terminal of the first monostable oscillator, said alarm being activated by the second output potential of the first monostable oscillator and inactivated by the first output potential of the first monostable oscillator, a second monostable oscillator having an input terminal electrically connected to the sensor and an output terminal adapted to carry a potential thereon, the potential on the output terminal of said second monostable oscillator changing from a third potential to a fourth potential responsive to an electrical signal impressed on the input terminal of said second monostable oscillator from the sensor and the potential on the output terminal of said second monostable oscillator remaining at said fourth potential for a second period of time and changing from said fourth potential to said third potential at the end of said second period of time, said second period of time being shorter than the first period of time, and means electrically connected to the output terminal of the second monostable oscillator for preventing actuation of the alarm during periods in which the fourth potential is applied to the output terminal of the second monostable oscillator, whereby actuation of the sensor results in actuation of the first and second monostable oscillators but actuation of the alarm is delayed during the second period of time.

4,092,644
DIGITAL WEATHER RADAR INCLUDING TARGET SEVERITY ANALYSIS CAPABILITY

Richard M. Hodge, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

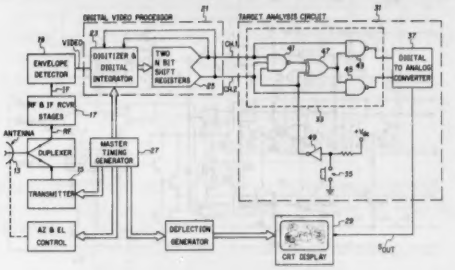
Filed Mar. 24, 1977, Ser. No. 780,942
Int. Cl.[2] G01S 9/60
U.S. Cl. 343—5 W 11 Claims

1. In a radar system of the type including (i) means for receiving echo signals from targets in a searched space, (ii) means for producing, from the received echo signals, digitally formatted data representative of the searched space, and (iii) digital memory means for storing said digitally formatted data for a predetermined time, the improvement comprising:

multiple state conversion means, including circuit means and display means, for converting said stored data into different visible light patterns in accordance with the state of said conversion means without affecting the gain (i.e., sensitivity) of said means for receiving,

said conversion means, when in a first state, converting said stored data into a light pattern wherein all target magnitudes below a predetermined magnitude M_L are represented as dark areas and all target magnitudes greater than M_L are represented as light areas,

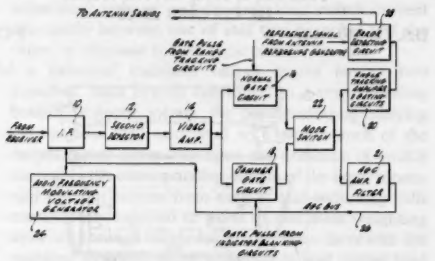
said conversion means, when in a second state, converting said stored data into a light pattern wherein all target magnitudes below a predetermined magnitude M_T, where $M_T > M_L$, are represented as dark areas and all target magnitudes greater than M_T are represented as light areas substantially the same as they would be represented in the first state light pattern.



4,092,645
RADAR JAMMER HOMING CIRCUIT

William H. Proud, Culver City, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 19, 1955, Ser. No. 509,500
Int. Cl.[2] G01S 7/36
U.S. Cl. 343—18 E 6 Claims



1. In a fire control radar system of the character which produces radar signals having a predetermined repetition period and which includes coupled in cascade; an intermediate frequency amplifier, a second detector, a video amplifier, a junction, an angle tracking gate, a selective switch, an angle tracking amplifier and integrating circuit, and an error detecting circuit for providing antenna control signals; and including also an automatic gain control loop coupled between the selective switch and the intermediate frequency amplifier; the system being adapted to automatically home on radar signals reflected off a distant object; the combination therewith of means for homing on signals emanating from the distant object, said means comprising: a jammer gate circuit coupled between the junction and the selective switch and being adapted to pass to said selective switch signals impressed on said jammer gate

circuit from said junction during the application of a long enabling pulse which is applied during the latter portion of the repetition period.

4,092,646

FLEXIBLE ANTENNA WITH CAPACATIVE PLATE COUPLING

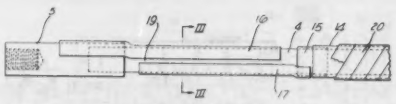
Geoffrey Thomas Newington, Portsmouth, England, assignor to The Marconi Company Limited, Chelmsford, England

Filed Jan. 5, 1977, Ser. No. 757,018

Claims priority, application United Kingdom, Dec. 31, 1975, 53309/75

Int. Cl.² H01Q *9/18, 21/06*

U.S. Cl. 343—749 **10 Claims**



1. A whip antenna comprising an elongated flexible core which is of electrically insulating material and which extends along a major part of the length of the antenna, electrically conducting flexible material carried on the surface of said core and extending along a major part of the length of the core to provide the required radio frequency path along the antenna, and a capacitor which is connected in said path, and which is formed by a pair of opposed spaced thin electrodes which lie on the surface of, are carrried by and embrace said core along part of its length, one of said electrodes being in electrical contact with an end of said material and the other of said electrodes being out of electrical contact with said one electrode and with said end of said material, the core material constituting the dielectric of said capacitor, said antenna being flexible over the length of the core carrying the material and the electrodes.

4,092,647

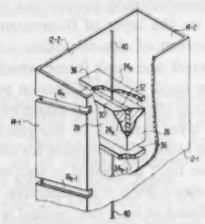
LINE SOURCE ANTENNA FOR SMALL ANGLE ELECTRONIC BEAM SCANNING

John Joseph Borowick, Bricktown; Boaz Gelernter, Elberon; Nathan Lipetz, Oakhurst, and Richard A. Stern, Allenwood, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 27, 1976, Ser. No. 754,642

Int. Cl.² H01Q *13/10, 1/00, 3/26*

U.S. Cl. 343—768 **9 Claims**



1. In a line source microwave antenna coupled to a source of RF energy and adapted to provide electronic beam scanning in a plane including the line source by means of at least one electronic driver circuit, the improvement comprising:

a section of waveguide microwave transmission line having broad and narrow side walls and including a lengthwise array of radiating slots periodically located in one side wall of said waveguide section;

latching ferrite phase shifter means requiring no holding current centrally located within said waveguide section between adjacent pairs of slots of said array, each said ferrite phase shifter means including a ferrite element and a dielectric loading element enclosed within said ferrite element; and including phase shifter control means coupled to said driver circuit for controlling the operative state of said ferrite phase shifter means in response to output signals from said driver circuit and thereby effect a relatively faster and substantially temperature invariant scanning of a beam of RF energy radiated from said array of slots, said driver circuit including a common electrical latching conductor passing centrally through said ferrite and dielectric loading elements and extending across a plurality of said slots for energizing said ferrite phase shifter means.

4,092,648

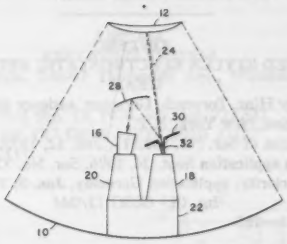
REFLEX FEED SYSTEM FOR DUAL FREQUENCY ANTENNA WITH FREQUENCY CUTOFF MEANS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Robert W. Hartop, South Pasadena, Calif.

Filed Mar. 24, 1977, Ser. No. 780,728

Int. Cl.² H01Q *19/14*

U.S. Cl. 343—782 **5 Claims**



1. In a dual frequency antenna system of the type which transmits or receives signals at a first high frequency which is high relative to signals at the second lower frequency, and wherein a reflex feed system is provided in which the signals are directed in a first path toward a high frequency horn, and where it is necessary to permit the high frequency energy in said first path to reach a high frequency horn, but to redirect the lower frequency signals from said first path to a second path to be received by a lower frequency horn, the improvement comprising:

a flange means mounted on said high frequency horn for redirecting lower frequency signals to said second path while blocking said lower frequency signals from flowing through said high frequency horn.

4,092,649

THERMOGRAPHIC RECORDER ENERGIZING ITS HEATED STYLUS INDEPENDENTLY OF STYLUS RESISTANCE

Robert Leroy Miller, Horsham, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

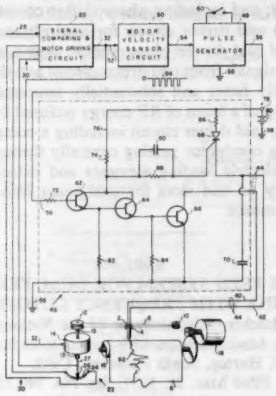
Filed Mar. 30, 1977, Ser. No. 782,730

Int. Cl.² G01D *15/10*

U.S. Cl. 346—76 R **10 Claims**

1. In a thermographic recorder including an electrically heated stylus having a heater and being arranged to mark a heat-sensitive record medium when said heater is energized, the improved energizing circuit for said heater including means connected across said heater for applying a voltage across said heater for each of a succession of heater enegizing periods, said means including further means for making the average value of said voltage during each of said periods to be a function of the value of the electrical resistance of said heater

which causes the total energy supplied to said heater during each of said periods, and hence the power supplied to said



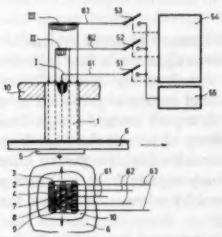
heater, to be substantially independent of said heater resistance value over a predetermined range thereof.

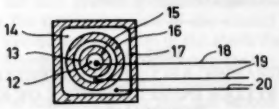
4,092,650

GROUPED STYLUS ELECTROSTATIC RECORDING HEAD

Hans-Dieter Hinz, Tornesch, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 586,517, Jun. 12, 1975, abandoned.
This application Sept. 24, 1976, Ser. No. 726,457
Claims priority, application Germany, Jun. 8, 1974, 2429114
Int. Cl.[2] G03G *15/044*
U.S. Cl. 346—155 **4 Claims**





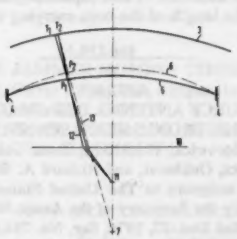
1. An electrostatic recording device for producing an image on an associated record carrier comprising: means for producing gray tones including a plurality of elongated recording electrodes for the formation of a latent recording in the form of a dot by each electrode when a high voltage is applied to said recording electrodes, each of said elongated recording electrodes comprising a plurality of sub-electrodes which are electrically insulated with respect to each other; each of said sub-electrodes being spaced from each adjacent sub-electrode a distance which is less than the minimum distance to produce an image on the associated carrier which will have the appearance of a continuous unbroken image when viewed at a normal reading distance, at least one sub-electrode from one recording electrode being electrically connected to at least one sub-electrode from another recording electrode, said sub-electrodes which are electrically connected constituting a group, said device further including switching means for selective switching voltage on each group independently of all other groups, at least two sub-electrodes in any of said recording electrodes being generally circular and disposed in generally concentric relationship, said device further including a generally square electrode disposed in generally coaxial relationship to each other sub-electrode in each of said recording electrodes at least at one axial portion thereof.

4,092,651

DEVICE AND METHOD FOR EXPOSING PHOSPHOR DOTS IN A COLOR TELEVISION PICTURE TUBE

Hans Rothfuss, Stuttgart, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 17, 1976, Ser. No. 715,344
Claims priority, application Germany, Aug. 27, 1975, 2538087
Int. Cl.[2] G03B *41/00*; G03C *5/00*
U.S. Cl. 354—1 **4 Claims**



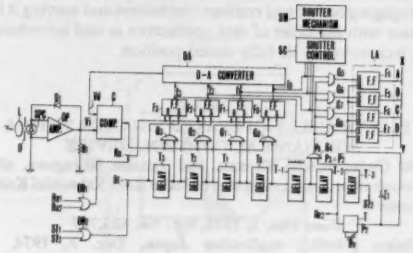
1. A device for exposing the photo-sensitive layer in the photo-chemical manufacturing process for creating the phosphor triple raster on the layer of fluorescent material on the faceplate of the screen of the television color picture tube, having a shadow mask and mask frame which allows for arching of said shadow mask from a minimum position to a maximum position during the warm-up phase of the operation of said tube, which layer consists of fluorescent material of a mosaic of different kinds of phosphors for emitting preferably red, green and blue light deposited in successive steps on the inside of said envelope with the respective deposited photosensitive layer utilizing at least one optical screen coating lens whose optically effective surface includes a shape so that it simulates the path of the respective electron beam being exposed to light at exactly defined points with the aid of a color-selecting electrode consisting of the shadow mask and the mask frame, wherein the shape of the optically effective surface of said screen coating lens is corrected in such a way that the phosphor triples, through the shadow mask at room temperature, are exactly exposed and shaped at those points on the coat of fluorescent material which are hit by the electron beams during the operation of the color television picture tube at the state of maximum arching of said shadow mask.

4,092,652

EXPOSURE INFORMATION INDICATING DEVICE FOR A CAMERA

Tadashi Ito; Fumio Ito, both of Yokohama; Yukio Mashimo, Tokyo; Nobuaki Sakurado, Yokohama, and Nobuhiko Shinoda, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 597,993, Jul. 22, 1975, abandoned.
This application Aug. 26, 1977, Ser. No. 828,175
Claims priority, application Japan Jul. 27, 1974, 49-86369
Int. Cl.[2] G03B 7/08, 17/20
U.S. Cl. 354—23 D 5 Claims



1. A camera, comprising:

(a) a light sensitive means for receiving an incident light from an object to be photographed and generating an analog signal corresponding to the amount of incident light received;

(b) an analog-to-digital converter coupled to the light sensitive means for converting the analog signal into digital form, wherein said analog-to-digital converter repeats analog to digital conversion with a prescribed period;

(c) an exposure control circuit for controlling the exposure value in response to the digital output signal from said analog-to-digital converter in digital form;

(d) a timing pulse generator for producing time pulses having a period longer than the prescribed period;

(e) a latching register;

(f) a pulse-controlled gate means connected between the output of said light sensitive means and the input of said latching register for transferring a periodically renewed signal corresponding to the digital output signal from the analog-to-digital converter in digital form to said latching register in response to the time pulses; and

(g) a digital information indicating means connected to the latching register for indicating an exposure value corresponding to the periodically renewed signal latched within the latching register in response to the timing pulses.

4,092,653

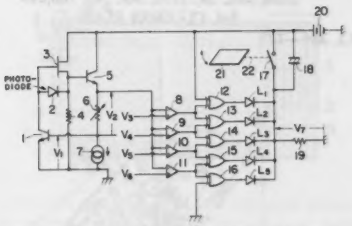
MIRROR MOVEMENT DISABLE CIRCUIT FOR LED DISPLAY IN LIGHT FINDER OF SLR CAMERA

Masahiro Kawasaki, Tokyo; Eiichi Tano, Asaka, and Yoshio Sawada, Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 22, 1976, Ser. No. 735,222
Claims priority, application Japan, Oct. 25, 1975, 50-128531
Int. Cl.[2] G03B 7/00, 17/20
U.S. Cl. 354—60 L 3 Claims

1. In a light meter for a single lens reflex camera including an array of LED display elements, means for energizing an individual one of said elements in accordance with a sensed brightness level and predetermined parameters defining the film sensitivity, the lens aperture opening and the exposure time, and a reflex mirror movable between an upper position and a lower position, the improvement comprising:

switch means adapted to be closed at the commencement of the movement of the mirror from its lower position to its upper position, the closure of said switch means extinguishing any energized LED element and disabling the subsequent energization of any LED elements, and said



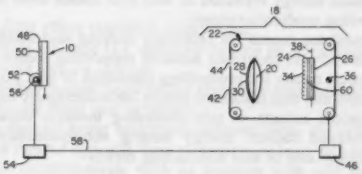
switch means adapted to be opened at the termination of the movement of the mirror from its upper position to its lower position.

4,092,654

ENCODING SYSTEM

Alfred V. Alasia, 146-07 Thirteenth Ave., Whitestone, N.Y. 11357

Filed Sep. 13, 1976, Ser. No. 722,532
Int. Cl.[2] G03B 35/00; G02B 27/22
U.S. Cl. 354—112 18 Claims



1. A three-dimensional imaging camera system for forming parallax panoramagrams of a subject, and comprising, in combination:

lens means having a focal plane;

means for defining a slit;

a graticule disposed adjacent said focal plane so as to form with said lens means a combined focal plane;

selectively operable exposure means for permitting formation, in operative cooperation with said means for defining a slit, an image of said subject at said combined focal plane;

supporting means for supporting said subject; and

means for moving said supporting means relative to said means for defining a slit, synchronously with the operation of said exposure means so as to provide an effective scanning aperture across said image plane and so as to simultaneously permit said formation of said image.

18. A sheet having a coded or scrambled form of an original artwork pattern made in accordance with the following steps:

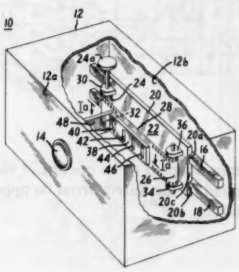
forming an image of said original artwork pattern in the combined image plane of a three-dimensional camera having a slit lens and a graticule having a plurality of parallel contiguous elongated elements; and

exposing a photosensitive element to said image while simultaneously moving said original artwork pattern and the slit of a focal plane-type shutter of said camera in a plane adjacent said slit lens, each transversely to the elongated direction of said graticule elements.

4,092,655
RADIANT ENERGY RECORDING APPARATUS

Joseph A. Ross, 26 Trescott Path, Fort Salonga, N.Y. 11768

Filed Jun. 29, 1976, Ser. No. 700,813
Int. Cl.[2] G03B 35/08
U.S. Cl. 354—124 15 Claims

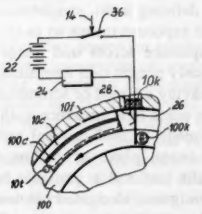


1. A radiant energy recorder system comprising:
(a) projector means for projecting patterned radiant energy into the projection field thereof;
(b) lens means having a field of view inclusive of at least part of said projection field;
(c) means for supporting an expanse of recording medium;
(d) a radiant energy conducting unit disposed between said lens means and said recording medium and having a plurality of commonly-shuttered conducting means in successive spaced disposition for issuing projected patterned radiant energy reflected to said lens means onto said recording medium expanse;
(e) translator means for relatively moving said conducting unit and said recording medium supporting means; and
(f) circuit means for controlling operation of said projector means and said translator means for successively exposing adjacent extents of said recording medium expanse to patterned radiant energy issuing simultaneously from distinct ones of said conducting means.

4,092,656
PHOTOGRAPHIC CAMERA WITH INTERCHANGEABLE LENS

Rudolf Lang, Grafing Bahnhof, and Gerhard Schwarz, Munich, both of Germany, assignors to Carl Zeiss Stiftung, Oberkochen, Germany

Filed Nov. 15, 1976, Ser. No. 742,020
Claims priority, application Germany, Nov. 17, 1975, 2551544
Int. Cl.[2] G03B 17/00, 17/38
U.S. Cl. 354—202 4 Claims

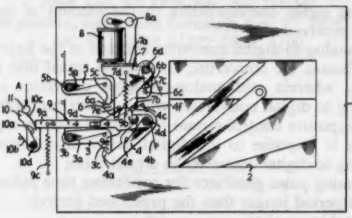


1. A photographic camera having a camera body and an interchangeable lens movable relative to said body between a first position fully seated on and engaged with said body and a second position not fully seated on said body, said camera comprising an electrically operated function actuator, an electric circuit for operating said actuator, and interrupter switch means responsive to the position of said interchangeable lens for disabling said electric circuit to prevent actuation of said function actuator when there is no interchangeable lens fully seated on said body in said first position, said interrupter switch means comprising a switch in said circuit, said switch being closed only with said interchangeable lens is fully seated in its said first position and being open at all other times, wherein said switch includes two resilient conductors mounted on said camera body and tending to remain out of contact with each other, and an actuator mounted on said interchangeable lens for engaging one of said resilient conductors and moving it into contact with the other of said conductors as said interchangeable lens moves to its fully seated position.

4,092,657
ELECTRICALLY OPERATED SHUTTER WITH A MECHANICAL CONTROL DEVICE

Eiichi Onda; Mitsuo Koyama, and Tadashi Nakagawa, all of Yotsukaido, Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Filed Dec. 1, 1975, Ser. No. 636,727
Claims priority, application Japan, Dec. 3, 1974, 49-146572[U]
Int. Cl.[2] G03B 9/08, 9/62
U.S. Cl. 354—234 1 Claim



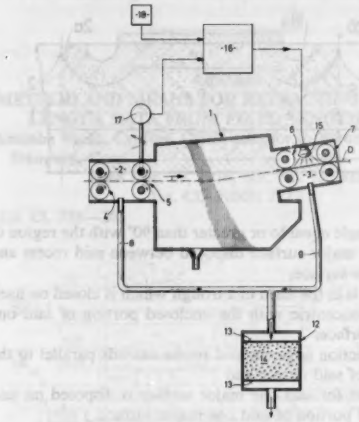
1. In a shutter mechanism including an aperture and shutter blades positionable for opening and closing said aperture, the improvement comprising:
(a) a shutter blade opening lever having a cocked position and a released position for positioning said shutter blades to open said aperture when moved from the cocked to the released position;
(b) a hook lever for engaging said shutter blade opening lever when the same is in the cocked position;
(c) a shutter blade closing lever having a cocked position and a released position for positioning said shutter blades to close said aperture when moved from the cocked to the released position;
(d) a second hook lever for engaging said shutter blade closing lever when the same is in the cocked position;
(e) an electromagnet energizable for controlling exposure time;
(f) an armature lever having a magnetizable first end portion proximate said electromagnet, means for releasing said second hook lever to a second end portion thereof remote from said magnetizable first end portion to release said closing lever, and means for engaging the first-mentioned hook lever to maintain said armature lever positioned to permit release of said opening lever before said means for releasing said second hook lever releases said second hook lever to release said closing lever;
(g) biasing means for biasing said armature lever away from said electromagnet to engage said first hook lever and release said second hook lever; and
(h) a control lever manually operable for releasing the first-mentioned hook lever to release said opening lever.

4,092,658

PHOTOPRINTING MACHINE WITH A DEVICE FOR EXPELLING EXCESS AMMONIA-CONTAINING DEVELOPER MEDIUM FROM DEVELOPED DIAZOTYPE PAPER

Herbert Schröter, Taunusstein, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Filed May 25, 1976, Ser. No. 689,960
Claims priority, application Germany, May 26, 1975, 2523228
Int. Cl.[2] G03D 7/00
U.S. Cl. 354—300 3 Claims



1. In a photoprinting machine comprising a developing chamber in which a web of exposed diazotype paper continuously fed at an adjustable speed is developed with a developer medium composed of a vaporous ammonia/water mixture, an after-treating chamber following next in the direction of feed of the diazotype paper and which is connected with a device for removing ammonia-containing exhaust air, and a device for expelling developer medium from the developed diazotype paper,

the improvement comprising a high-energy infrared radiator positioned opposite the web in the after-treating chamber, means electrically connecting said high-energy infrared radiator to an output of an electrical heat output control device, an input of which control device is connected to a transmitter of the feed speed, the heat output control device having a characteristic such that the heat output of the high-energy infrared radiator is proportional to the feed speed, and the color temperature of the high-energy infrared radiator is about 2000° K at the maximum feed speed of the diazotype paper.

4,092,659

MULTI-LAYER REFLECTOR FOR ELECTROLUMINESCENT DEVICE

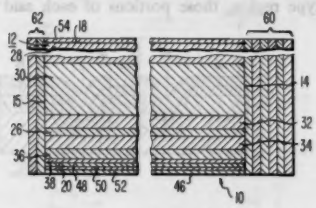
Michael Ettenberg, Freehold, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 28, 1977, Ser. No. 791,944
Int. Cl.[2] H01S 3/00, 3/00
U.S. Cl. 357—18 7 Claims

1. A semiconductor electroluminescent device comprising:

a body of semiconductor material capable of radiation emission in the wavelength range of 0.6 to 1.3 micrometers, said body having opposed facet surfaces from which the radiation is capable of being emitted; and

a reflector on at least one facet surface, said reflector having a plurality of contiguous layers of alternating composition, said layers being of silicon (Si) and a material selected from the group consisting of aluminum oxide (Al_2O_3), magnesium fluoride (MgF_2) and silicon dioxide (SiO_2), said layer being contiguous to said facet surface is of said selected group of material, said contiguous layers are each approximately $\lambda/4n$ in thickness, where "λ" is the



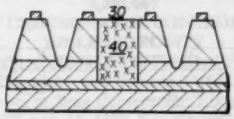
free space wavelength of radiation emitted from the electroluminescent device, and "n" is the index of refraction of the layer.

4,092,660

HIGH POWER FIELD EFFECT TRANSISTOR

Truman G. Blocker, III, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 16, 1974, Ser. No. 506,635
Int. Cl.[2] H01L 29/78, 29/48, 29/06
U.S. Cl. 357—22 4 Claims



1. A field effect transistor comprising:

a gallium arsenide N+ substrate having an N epitaxial layer on one surface thereof,

a Schottky barrier layer on the surface of said epitaxial layer opposite from said substrate,

said substrate being selectively relieved from the other surface thereof opposite from said epitaxial layer to a depth at least commensurate with its junction with said epitaxial layer but short of said barrier layer to define at least two separated mesas above said epitaxial layer and spaced apart by a region including a portion of said epitaxial layer,

terminal contacts on said mesas,

a gate terminal structure connected to said barrier layer, and

said at least two separated mesas serving as a source and as a drain respectively, the mesa serving as the source having a structurally altered electrically inactive central portion thereby to reduce the gate-to-source capacitance.

4,092,661

MOSFET TRANSISTOR

Willis G. Watrous, Jr., Mountain View, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Division of Ser. No. 450,773, Mar. 13, 1974, Pat. No. 3,986,903. This application May 20, 1976, Ser. No. 688,466
Int. Cl.[2] H01L 29/78
U.S. Cl. 357—23 3 Claims

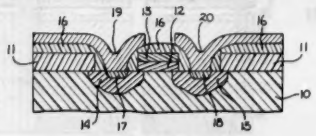
1. A field effect semiconductor device which comprises:

(a) a p type semiconductor region;

(b) a pair of spaced n type regions diffused into the surface of said p type region, said spaced n type regions forming the source and drain regions and defining a channel of said field effect semiconductor device;

(c) at least one gate element insulated from said p type semiconductor region and located between and in a substantially nonoverlapping relationship with said spaced n type regions;

(d) a pair of n++ type regions, formed by diffusion of an impurity, within the pair of said spaced *n* type regions and
(e) pn junctions between each of said *n* type regions and said *p* type region, those portions of each said pn junction



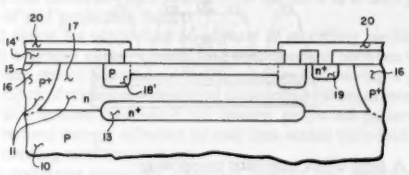
directly adjacent said channel being shallower, with respect to said surface, than deeper portions of said pn junctions, said deeper portions being more distal from said channel.

4,092,662

SENSISTOR APPARATUS

James M. Daughton, Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 29, 1976, Ser. No. 727,737
Int. Cl.[2] H01L *23/56, 29/66, 27/04*
U.S. Cl. 357—28 **7 Claims**



1. A monolithic integrated circuit sensistor, provided in a semiconductor material and having a selected total resistance and a selected temperature coefficient of resistance, said sensistor comprising:
an isolated region in said semiconductor material having a first conductivity type;
a resistor region of a second conductivity type which is determined by ions implanted therein in a selected dose to provide said temperature coefficient of resistance having a value other than substantially zero, said resistor region being located in said isolated region with a semiconductor junction occurring between said resistor region and said isolated region; and
an interconnection network means adapted to electrically connect said resistor region into a circuit.

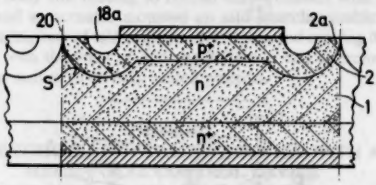
4,092,663

SEMICONDUCTOR DEVICE

Horst Schäfer, Zirndorf-Nuremberg, Germany, assignor to Semikron Gesellschaft für Gleichrichterbau und Elktronik m.b.H., Nuremberg, Germany

Filed Aug. 5, 1974, Ser. No. 494,856
Claims priority, application Germany, Aug. 8, 1973, 2340128
Int. Cl.[2] H01L *29/06, 29/74*
U.S. Cl. 357—55 **1 Claim**

1. In a semiconductor device with a high blocking capability comprising a semiconductor wafer having at least two layer type zones of alternatingly opposite conductivity type and different doping concentrations and forming a pn junction therebetween which intersects the edge surface of the semiconductor wafer, the higher doped of said at least two zones forming said pn junction being an outer zone of said semiconductor wafer and extending along one of the major surfaces thereof, said edge surface of said semiconductor wafer enclosing, within the lower doped of said at least two zones, an angle of less than 90° with the surface of the pn junction, and a contact on each of the opposed parallel major surfaces of said wafer, the improvement wherein:
said semiconductor wafer is disc shaped;
said edge surface of said semiconductor wafer is substantially perpendicular to said major surfaces of said semiconductor wafer;
a recess is formed in said one major surface at a predetermined distance from said edge surface and within said higher doped zone, the edge portion of said recess enclos-



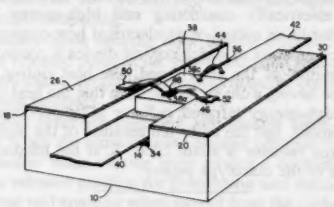
ing an angle equal to or greater than 90° with the region of said one major surface disposed between said recess and said edge surface;
said recess is in the form of a trough which is closed on itself and is concentric with the enclosed portion of said one major surface;
said pn junction adjacent said recess extends parallel to the surface of said recess; and
said contact for said one major surface is disposed on said enclosed portion of said one major surface.

4,092,664

CARRIER FOR MOUNTING A SEMICONDUCTOR CHIP

John M. Davis, Jr., Torrance, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 658,202, Feb. 17, 1976, abandoned, which is a division of Ser. No. 538,059, Jan. 2, 1975, Pat. No. 3,961,415. This application Jul. 21, 1977, Ser. No. 817,772
Int. Cl.[2] H01L *39/02, 23/28, 23/02*
U.S. Cl. 357—80 **1 Claim**



1. An assembly for electrically and mechanically mounting a semiconductor chip having minimum lead losses at least at its emitter lead connection comprising:
a carrier of insulating material having a surface and means therein for defining a recess and a recess bottom;
a layer of electrically conductive material coupled to said carrier surface and to said recess bottom means;
a semiconductor chip having upper and lower surfaces and an emitter contact on said upper surface, said lower surface electrically and mechanically coupled to said electrically conductive material on said recess bottom means and said upper surface substantially flush and contiguous with and adjacent to said electrically conductive material on said carrier surface for presenting a minimum distance between said emitter contact and said upper surface; and
a flat ribbon lead coupled between said electrically conductive material on said carrier upper surface and said emitter

contact on said semiconductor chip for cooperating with the minimum distance in minimizing the lead inductance of the emitter,

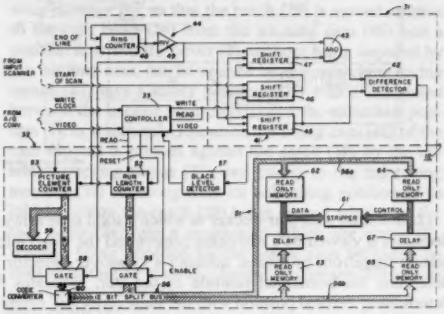
said semiconductor chip and connections thereof to said carrier having a characteristic impedance (Z) and said flat ribbon lead having a length (A) interrelated in the relationship $L = ZA/C$, where C is the velocity of light, for minimizing the inductance (L) and thereby for permitting the circuit comprising said semiconductor chip and said connections thereof to said carrier to minimize decrease of the available gain of said semiconductor chip.

4,092,665

METHOD AND MEANS FOR EXTRACTING VARIABLE LENGTH DATA FROM FIXED LENGTH BYTES

Amitabh Saran, Cypress, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 29, 1976, Ser. No. 755,313
Int. Cl.² H04N 7/12
U.S. Cl. 358—261 **7 Claims**



6. A method for extracting variable length data from a word oriented memory having first and second parallel memory banks, said method comprising the steps of

storing a plurality of fixed length data words in said first memory bank at predetermined addresses, each of said data words containing at least one relevant data bit and any additional bits necessary to achieve said length;

storing an equal number of fixed length control words in said second memory bank at addresses selected to associate each of control words with a respective one of said data words,

addressing said first and second memory banks in parallel to simultaneously read out a selected data word and an associated control word from said first and second memory banks, respectively,

extracting the relevant data bits from said selected data word in response to said associated control word.

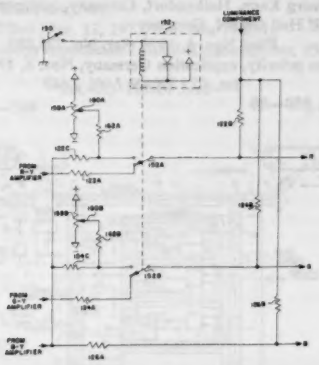
4,092,666

MONOCHROME PRESENTATION OF DEMODULATED COLOR SIGNALS

Charles Wesley Rhodes, Beaverton, and Philip Stephen Crosby, Portland, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Dec. 10, 1976, Ser. No. 749,581
Int. Cl.² H04N 9/62
U.S. Cl. 358—10 **7 Claims**

1. In a method for displaying system produced defects of color television composite video color decoded component signals wherein the decoded signals are applied to separate electron guns of a color display device, the improvement comprising:



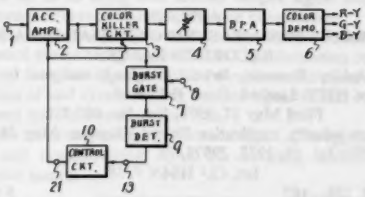
applying one of the decoded signals to each of the separate electron guns to thereby improve the visual perception of the defects on the display.

4,092,667

AUTOMATIC CHROMINANCE CONTROL AND COLOR KILLER CIRCUITS

Susumu Akazawa, Ichikawa; Takao Tsuchiya, Fujisawa; Kyoichi Murakami, Chigasaki, and Takashi Okada, Yamato, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 13, 1977, Ser. No. 787,155
Claims priority, application Japan, Apr. 20, 1976, 51-45197
Int. Cl.² H04N 9/49
U.S. Cl. 358—26 **2 Claims**



1. Apparatus for use in a color television receiver of the type including circuitry for processing a composite television signal, said receiver including a chrominance channel having a gain controllable chrominance amplifier for selectively amplifying chrominance signals and color burst signals transmitted with said composite signal during a color television transmission, said apparatus comprising:

a. a burst level detector connected to said chrominance amplifier for detecting the level of said burst signals;

b. a control circuit including a time constant circuit connected to said burst level detector for deriving a control signal in response to said detected burst signal;

c. first means for supplying said control signal to said chrominance amplifier for controlling the gain thereof;

d. second means responsive to said control signal for activating said chrominance channel when the level of said control signal goes over a predetermined level and inactivating said chrominace channel when the level of said control signal goes below said predetermined level, and

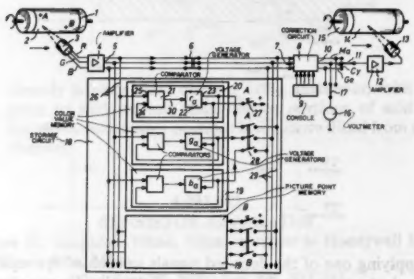
e. means connected between said burst level detector and said time constant circuit for shortening the time constant of said time constant circuit when the level of the output signal of said burst level detector goes below a predetermined level.

4,092,668

CORRECTION CIRCUIT FOR A COLOR SCANNER

Hans-Georg Knop, Heikendorf, Germany, assignor to Dr. Ing. Rudolf Hell GmbH, Germany

Filed Nov. 4, 1976, Ser. No. 738,883
Claims priority, application Germany, Nov. 8, 1975, 2550273
Int. Cl.[2] H04N *1/46, 1/40*
U.S. Cl. 358—80 6 Claims



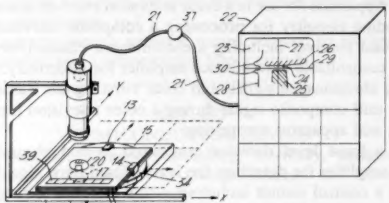
4. A correction circuit for a scanning system having a scanning means producing a plurality of output signal voltages from a picture master and a recording means comprising a first switching means receiving the output signal voltages from said scanning means, a correction circuit connected to the first switching means and connectable to said scanning means, a memory means connected to said scanning means for individually storing said plurality of output signal voltages associated with discrete picture points of said picture master, and second switching means connected to said memory means for selectively supplying said stored signal voltage to said correction circuit.

4,092,669

APPARATUS FOR MEASURING SPATIAL DATA FROM RECORDED IMAGES

Keith Ashley Brasnett, Bristol, England, assignor to Rolls-Royce (1971) Limited, Great Britain

Filed May 17, 1976, Ser. No. 687,216
Claims priority, application United Kingdom, May 31, 1975, 23735/75; Jul. 15, 1975, 29575/75
Int. Cl.[2] H04N *7/18*
U.S. Cl. 358—107 5 Claims



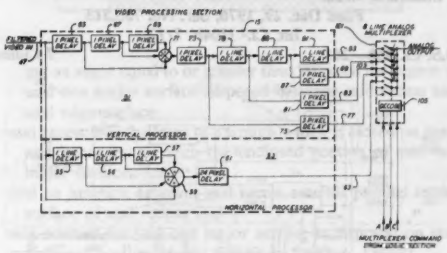
1. Apparatus capable of taking spatial measurements of the relative positions of features of a recorded image comprises a co-ordinate measuring framework, a video camera disposed to scan a selectable area of the recorded image, wherein the video camera and recorded image are mounted for relative movement therebetween on the co-ordinate measuring framework, there being provided means for passing output information from the video camera to a video-microdensitometer for displaying an amplified image of the selected area of said recorded image on an output screen of the video microdensitometer together with a plot representative of the optical density variation along a selected line through said amplified image, said video microdensitometer incorporating at least one datum mark against which the amplified image and corresponding portions of the said plot may be aligned by relative movement of the recorded image and video camera within the co-ordinate measuring framework whereby the relative spatial disposition of parts of the recorded image are determinable from said relative movements by means of the co-ordinate measuring framework.

4,092,670

VIDEO PROCESSOR FOR SOLID STATE STAR TRACKER

Ernest Carl Wittke, Baldwin, N.Y., assignor to The Singer Company, Little Falls, N.J.

Filed Dec. 9, 1976, Ser. No. 748,989
Int. Cl.[2] H04N *7/18*
U.S. Cl. 358—125 33 Claims



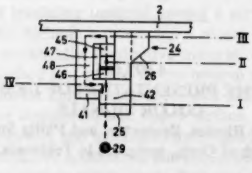
12. In a solid state star tracker in which a solid state array of detectors is viewed by a television camera and the video information therefrom processed utilizing a crossover detector to determine the horizontal position of the star, apparatus for determining vertical position with the same crossover detector comprising means for twisting one or more rows of vertical information to cause those rows to become horizontal information and means to permit said crossover detector to process the twisted rows of information to determine vertical position.

4,092,671

VIDEO PLAYER HAVING PLURAL SAFETY DEVICES ACTUATED BY UNLATCHING

Eduard Camerik, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 628,092, Nov. 3, 1975, Pat. No. 4,032,971. This application Apr. 11, 1977, Ser. No. 786,603
Claims priority, application Netherlands, Feb. 9, 1977, 7701332
Int. Cl.[2] H04N *5/76;* G11B *17/00*
U.S. Cl. 358—128 1 Claim



1. A video disc player for playing back optically readable video discs (3), comprising:

a housing (1) with a recess (49),

a cover (2) which is movable about a pivoting axis (50) between a fully opened position and a fully closed playing

position (III) and which in the playing position covers a video disc which has been put on,

latching means for latching the cover in its playing position (III), comprising a spring-loaded movably journalled catch (29), and a cam body (24) which is secured to a side (front side) of the cover (2) opposite the pivoting axis (50), which cam body in the playing position extends into the said recess (49) in the housing (1) and is provided with a latching cam (45), which co-operates with the catch (29) in the playing position of the cover and with a safety cam (41),

unlatching means for releasing the cover (2) from its latched position (III) into an unlatched position (I) from which the cover, without being impeded by latching means, can be moved into the fully opened position, which unlatching means comprise a manual actuating member (4) an unlatching member (33) on which the catch (29) is journalled which unlatching member is movable between an initial position and an unlatching position by means of the manual actuating member, as well as unlatching spring means (27) for resiliently urging the cover (2) from its playing position (III) towards its unlatched position (I), the unlatching member (33) being moved from its initial position to its unlatching position by actuation of the manual actuating member (4), so that the catch (29) is moved relative to the cam body (24) from the latching cam (45) into a position in which the cover (2), without being impeded by the latching spring means (27) into a safety position (IV) which is situated between the latched position (III) and the unlatched position (I), in which safety position the safety cam (41) of the cam support is pressed against the catch (29) by the unlatching spring means (27), and owing to the unlatching member (33) returning from its unlatching position to its initial position the catch (29) being moved relative to the cam body (24) into a position in which the cover (2), without being impeded by the safety cam (41), can be opened further by the unlatching spring means (27) into its unlatched position (I),

a main motor (5),

a drive spindle (6) driven by the main motor for rotating a video disc (3),

an electric supply source for powering the main motor (5),

a main motor switch (9) for switching on and switching off the supply of an electric supply current to the main motor (5) with the aid of the cam body (24), switching on being effected by a movement of the cover (2) from its unlatched position (I) to its playing position (III) and switching off being effected by the movement of the cover (2) from its playing position (III) to its safety position (IV), and

a safety mechanism (36) which prevents the unlatching member (33) from returning from its unlatching position to its initial position for a certain time interval which is sufficient to allow the speed of rotation of the drive spindle to be reduced to a non-hazardous safe value,

characterized in that the cam body (24) is provided with an additional latching cam (46) which, if the said unlatching member (33) is in its initial position, cooperates with the catch (29) if the cover (2) is in an intermediate position (II) situated between the unlatched position (I) and the playing position (III), in which intermediate position the application of supply current to the main motor (5) has not yet been switched on by the cam body (24), and the cam body (24) is furthermore provided with an additional safety cam (47) which when the catch (29) is situated on the additional latching cam (46) prevents the unlatching member (33) from being moved from its initial position to its unlatching position by co-operation with the catch (29), so as to prevent the cover (2) from being opened completely when the cover has not yet reached its playing position (III) but in the meantime has assumed a position in which the supply current is already applied to the main motor (5).

4,092,672

MASTER OSCILLATOR SYNCHRONIZING SYSTEM

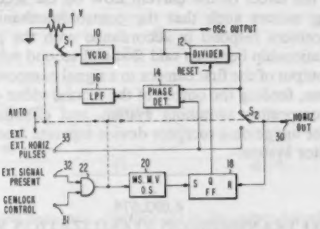
Felix Aschwanden, Thalwil, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Mar. 11, 1977, Ser. No. 776,711

Claims priority, application United Kingdom, Nov. 15, 1976, 47546/76

Int. Cl.² H04N 5/12

U.S. Cl. 358—149 **3 Claims**



1. A system for sychronizing an oscillator circuit having two or more output signals of substantially different frequencies from a single external reference signal, comprising:

an oscillator circuit for generating a first output signal;

divider circuit means coupled to said oscillator for developing a second output signal from said first output signal;

a source of external reference signal at substantially the same frequency as said second output signal;

phase detector means responsive to said second output signal and said external reference signal for developing a phasing control signal indicative of the phasing difference between said second output signal and said external reference signal;

means for coupling said phasing control signal to said oscillator so as to bring said second output signal and said external reference signal into phase coincidence;

control means coupled to said divider circuit means, said control means being responsive to a synchronizing control signal for resetting said divider circuit means upon application of said synchronizing control signal to said control means and further responsive to

the first occurring external reference signal after application of said synchronizing signal for enabling said divider circuit means.

4,092,673

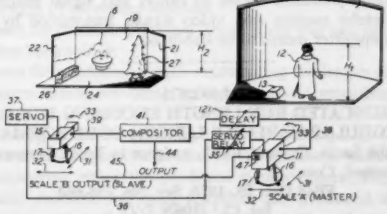
COMPATIBLE COMPOSITE IMAGE PROCESS

Jay W. Adams, 937 E. Groton Dr., Burbank, Calif. 91504

Continuation-in-part of Ser. No. 529,230, Dec. 3, 1974, abandoned. This application May 18, 1976, Ser. No. 687,442

Int. Cl.² H04N 5/22, 5/24; G03B 15/08

U.S. Cl. 358—183 **4 Claims**



1. In a composite video picture process employing the video chroma key process and at least a first and second video cam-

era each having actuating motors engaging control mechanisms for controlling camera attitude toward the camera subject, the process comprising the steps of comprehending with the first camera a first subject before a single hued background, preparing a second correlated subject having a pre-selected scale relationship to the first subject, comprehending said second subject with said second video camera, sensing the current flow in the actuating motors of the first video camera at each change of first camera attitude, imposing the sensed current flow on the like motors of the second video camera, altering the effect of the current flow on the second camera actuating motors such that the control mechanism of said second camera respond in accordance with the pre-selected scale relationship between said first and second subjects, feeding the output of the first camera to a signal compositor switching system, feeding the output of the second video camera to a signal compositor switching system, and effecting a single composite image on a receptor device separate from the signal compositor system.

4,092,674

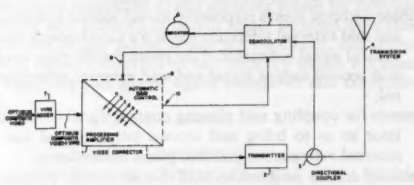
VIDEO TRANSMISSION STABILIZATION SYSTEM

Charles Wesley Rhodes, Beaverton, and David James Jurgensen, Gaston, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 498,903, Aug. 20, 1974, abandoned, which is a continuation of Ser. No. 343,746, Mar. 22, 1973, abandoned. This application Oct. 6, 1976, Ser. No. 729,744

Int. Cl.[2] H04N *9/535, 5/38*

U.S. Cl. 358—186 **5 Claims**



1. A video transmission stabilization system for stabilizing a transmitted signal, comprising:

signal processing means for processing video signals applied thereto;

transmitter means for transmitting said video signals processed by said signal processing means;

detector means responsive to said video signals transmitted by said transmitter means for extracting said video signals including any signal distortions created by the system, said detector means including means for adding a substantially distortionless control signal to said video signals extracted thereby; and

control means coupled between said detector means and said signal processing means for providing correction signals to said processing means to automatically stabilize the system including means for modifying said correction signals in accordance with said control signal to cause said signal processor means to cancel said signal distortions thereby causing said video signals transmitted by said transmitter means to be stabilized.

4,092,675

TRUNCATED RUN LENGTH ENCODING WITH A MODULAR VARIABLE LENGTH CODE FORMAT

Amitabh Saran, Cypress, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 29, 1976, Ser. No. 756,663

Int. Cl.[2] H06N *7/12*

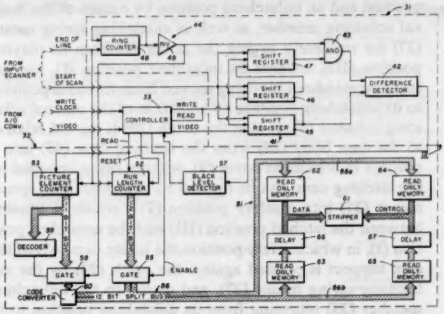
U.S. Cl. 358—261 **8 Claims**

1. A data compressor for compressing binary video signals of the type having a predetermined number of serial picture elements for each of a plurality of successive scan lines with black and white picture elements being at opposite logic levels; said data compressor comprising the combination of

difference modulating means for converting the picture elements for certain of said scan lines into modulated picture elements representing the modulo-2 difference between the picture elements being converted and spatially corresponding picture elements for an adjacent scan line;

line counter means for supplying a control signal to periodically disable said modulating means, whereby said modulating means provides unmodulated picture elements for other of said scan lines;

memory means for storing a plurality of block length multiple codes, another plurality of run length residue codes, two distinct end of line message codes, and an individual message bit at different predetermined addresses;



run length detector means coupled between said modulating means and said memory means for applying a run length dependent address code to said memory means in response to each black terminated intra-scan line sequence of picture elements, whereby appropriate ones of said block length multiple codes, run length residue codes, and individual message bit selectively read out of said memory means to represent said sequences;

means for counting said picture elements to provide a predetermined signal for distinguishing said scan lines from one another, and

means coupled to said picture element counting means and to said line counting means for supplying address codes to selectively read one and the other of said end of line message codes out of said memory means upon concluding scan lines of modulated and unmodulated picture elements, respectively.

4,092,676

BLOCK LENGTH MULTIPLE PLUS RUN LENGTH RESIDUE CODES FOR RUN LENGTH ENCODING

Amitabh Saran, Cypress, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 29, 1976, Ser. No. 755,309

Int. Cl.[2] H04N *7/12*

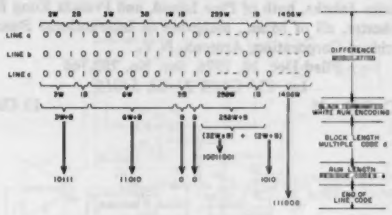
U.S. Cl. 358—261 **12 Claims**

1. In combination with raster scanning means for converting the information content of a subject copy into a binary video signal having black and white picture elements of opposite logic levels, the improvement comprising

run length encoding means for encoding runs of picture elements conforming to a given pattern in accordance with a block length multiple plus run length residue code format, whereby

any run at least equal to a predetermined block length is represented by a block length multiple code plus, if said

run is a non-integer multiple of said block length, a run length residue code, and

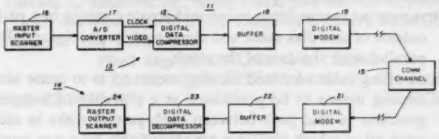


any shorter run is represented solely by a run length residue code.

4,092,677
TRUNCATED RUN LENGTH ENCODING FOR FRACTIONALLY DIFFERENCE MODULATED VIDEO SIGNALS

Amitabh Saran, Cypress, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 29, 1976, Ser. No. 756,662
Int. Cl.² H04N 7/12
U.S. Cl. 358—261 **9 Claims**



7. A method for compressing a binary video signal having a predetermined number of serial picture elements for each of a plurality of successive scan lines and including black and white picture elements of opposite logic levels; said method comprising the steps of

converting picture elements for selected ones of said scan lines into modulated picture elements representing the modulo-2 difference between the picture elements for the selected scan line and the spatially corresponding picture elements for an immediately proceeding scan line,

retaining unmodulated picture elements for other of said scan lines,

converting black terminated intra-scan line runs of white picture elements and non-terminating black picture elements into corresponding run length message codes and individual message bits, respectively, without distinguishing between modulated and unmodulated picture elements, and

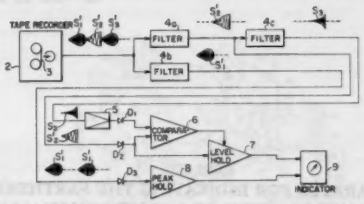
converting unterminated intra-scan line runs of white picture elements into end of line message codes, using one code for runs of modulated picture elements and another code for runs of unmodulated picture elements, whereby said end of line message codes distinguish between scan lines of modulated and unmodulated picture elements.

4,092,678
BIAS SETTING METHOD FOR MAGNETIC RECORDING-REPRODUCING APPARATUS

Masao Nishikawa, Nagoya, Japan, assignor to Shin-Shirasuna Electric Corp., Najoya, Japan

Filed Dec. 16, 1976, Ser. No. 751,036
Claims priority, application Japan, Dec. 23, 1975, 50-154209
Int. Cl.² G11B 27/36, 5/47
U.S. Cl. 360—31 **1 Claim**

1. A bias setting method for magnetic recording-reproducing apparatus, which comprises the steps of alternately generating a first signal of a relatively high frequency the amplitude of which varies with time and a second signal of a relatively low frequency the amplitude of which varies with time, recording said first and second signals, together with a bias signal of a predetermined value, on a magnetic recording medium by said magnetic recording-reproducing apparatus, reproducing the recorded first and second signals, detecting a point of time

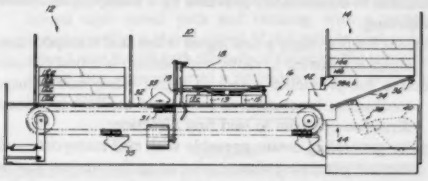


when the third harmonic component of the reproduced second signal comes to have a predetermined level ratio with respect to the reproduced second signal, holding the level of the reproduced second signal at said point of time while at the same time holding the peak level of the reproduced first signal, and setting said bias at a required value on the basis of the difference or ratio between the levels of the held first and second signals.

4,092,679
APPARATUS FOR VARIABLY SELECTING THE CAPACITY OF A RECORDING MEDIUM IN A RECORDING SYSTEM

Willy M. Sander, Stamford, Conn., assignor to Dictaphone Corporation, Rye, N.Y.

Filed Sep. 10, 1976, Ser. No. 722,141
Int. Cl.² G11B 15/68, 19/06, 23/04
U.S. Cl. 360—71 **16 Claims**



1. In a recording system having a recorder capable of being seized to enable messages to be recorded on a recording medium of fixed length, apparatus for indicating when a preselected recording capacity of said medium has been consumed, comprising:

adjustable means for establishing a preselected capacity of recorded messages;

switch means for selecting said capacity to be either a predetermined number of recorder seizures or a predetermined length of recording medium;

means for producing a signal representing that said recorder has been seized;

means for producing signals representing the length of messages which are being recorded on said recording medium;

counting means for counting said produced signals;

gate means responsive to said switch means for selectively supplying either the produced signals representing that said recorder has been seized or the produced signals representing the length of messages to said counting means;

comparing means coupled to said counting means and to said adjustable means for detecting when said count corre-

sponds to said established preselected capacity and for generating an output signal indicative thereof; and

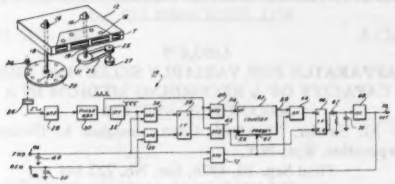
utilization means coupled to said comparing means for utilizing said generated output signal in a predetermined manner.

4,092,680

APPARATUS FOR INDICATING THE FARTHEST ADVANCE POSITION OF A BI-DIRECTIONALLY MOVABLE MEDIUM

Willy M. Sander, Stamford, Conn., assignor to Dictaphone Corporation, Rye, N.Y.

Filed Sep. 10, 1976, Ser. No. 722,142
Int. Cl.[2] G11B *27/14, 27/20, 19/06*
U.S. Cl. 360—72 8 Claims



1. Apparatus for indicating the farthest advance position of a medium bi-directionally movable by a transport mechanism, comprising:

means for providing a first signal when said transport mechanism is actuated to move said medium in a first direction;

means for providing a second signal when said transport mechanism is actuated to move said medium in a second direction opposite to said first direction;

pulse generating means operable with said transport mechanism to generate pulses representing the amount that said medium moves either in said first or in said second direction;

bi-directional counting means selectively responsive to each generated pulse to incrementally change the count thereof in a first or second direction;

gating means for coupling said generated pulses to said counting means when said medium moves in said second direction so that said counting means incrementally changes its count from an initial count and in a first direction and for coupling said generated pulses to said counting means when said medium moves in said first direction following movement in said second direction so that said counting means incrementally changes its count in a second direction so as to be restored to said initial count;

gate control means responsive to said first and second signals and to said generated pulses for energizing said gating means when said first or second signal is initiated in non-coincidence with a generated pulse and for maintaining said gating means energized if said first or second signal terminates but said pulses continue to be generated; and

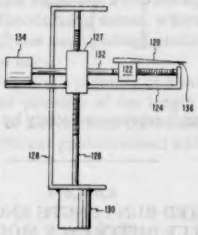
output means for producing a farthest advance signal when said counting means is restored to said initial count and for maintaining said farthest advance signal until said medium subsequently is moved in said second direction.

4,092,681

FLEXIBLE DISK FILE ACCESS MECHANISM

Gary Lee Dix, Rochester; Charles Christian Hanson; Robin Charles Jahnke, both of Pine Island, and Francis Kong King, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1976, Ser. No. 752,766
Int. Cl.[2] G11B *21/02, 5/016*
U.S. Cl. 360—75 12 Claims



1. A data storage device comprising:

a stack of axially aligned flexible disks,

a drive spindle on which said disks are mounted for rotating the disks,

a unique identification character on each of said disks,

means for sensing said identification characters,

first moving means for moving said sensing means in a path outside of said disk stack and along said stack substantially parallel with the axis of the stack,

controlling means for said moving means so as to cause said sensing means to be positioned at a plurality of stepped positions in said path between each pair of disks in said stack all of which positions are identifiable by a step number,

controlling means for said sensing means to cause said sensing means to detect the said identification character of an adjacent one of said disks for each of said stepped positions,

a position register for storing said step numbers for each of said identification characters detected by said sensing means and

means for averaging said step numbers for each of said identification characters and corresponding to each pair of disks in said stack.

4,092,682

CROSS COUPLED DEMODULATOR FOR GENERATING A SERVO HEAD POSITION ERROR SIGNAL

Thomas L. Andrews, Jr., Santa Clara, and Charles E. Mendenhall, San Jose, both of Calif., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Aug. 10, 1976, Ser. No. 713,132
Int. Cl.[2] G11B *5/58, 19/14, 21/10*
U.S. Cl. 360—77 5 Claims

1. A servo system for positioning a movable member in alignment with a servo track formed by prerecording cyclic dibit signals to each side of the track, said system comprising, in combination:

an actuator for positioning said movable member responsive to an error signal;

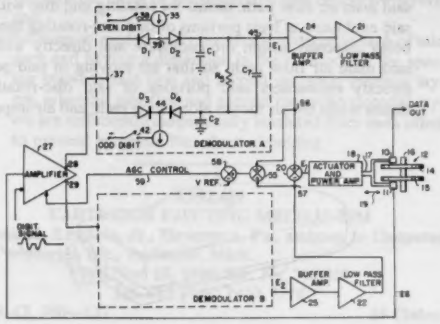
a servo head for detecting said prerecorded dibit signals;

a demodulator for receiving said dibit signals from the servo head and generating an output error signal responsive to the relative magnitude of the two dibit signals one to each side of the servo track, said demodulator comprising

means to generate a direct current signal having a magnitude responsive to the magnitude of each dibit signal and

means to reduce the magnitude of each direct current signal

by a magnitude proportional to any change in magnitude of said other direct current signal to assure that each



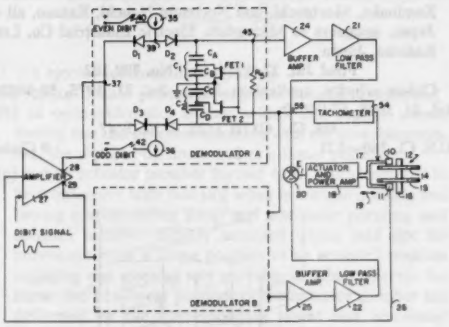
direct current signal is responsive to the corresponding dibit signal.

4,092,683

DUAL-MODE DEMODULATOR FOR MOVEMENT OF A SERVO HEAD

Thomas L. Andrews, Jr., Santa Clara, and Charles E. Mendenhall, San Jose, both of Calif., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Aug. 10, 1976, Ser. No. 713,133
Int. Cl.[2] G11B *5/58, 19/14, 21/10*
U.S. Cl. 360—77 **4 Claims**



1. A servo system for positioning a movable member in alignment with a servo track formed by prerecording cyclic dibit signals to each side of the track, said system comprising in combination:

an actuator for positioning said movable member responsive to an error signal;

a servo head for detecting said prerecorded dibit signals;

a demodulator for receiving said dibit signals from the servo head and generating an output error signal responsive to the relative magnitude of the two dibit signals;

said demodulator including a capacitive circuit charged by the separate dibit signals;

means to partially discharge said capacitive circuit between dibit signals to reset said capacitive circuit to receive additional dibit signals;

means for detecting the charge in said capacitive circuit for generating an error signal for controlling said actuator; and

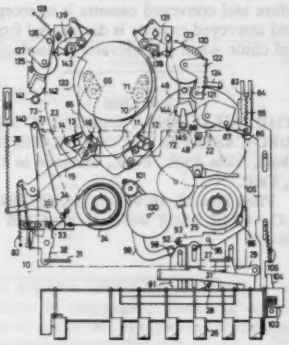
means for changing the capacitance of said capacitive circuit to vary the discharge rate thereof.

4,092,684

AUTOMATIC LOADING VIDEO RECORDER WITH SPEED STABILIZING

Hiroyuki Umeda, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Feb. 23, 1977, Ser. No. 771,256
Claims priority, application Japan, Feb. 25, 1976, 51-19563
Int. Cl.[2] G11B *15/66*
U.S. Cl. 360—85 **6 Claims**



1. A video signal recording and/or reproducing apparatus comprising:

a guide drum having at least one rotating head for recording and/or reproducing video signals;

loading means for drawing out a tape accommodated within a cassette and loading said tape in a specific tape travel path including a part wherein the tape is in wrapping contact with a predetermined arcuate portion of said guide drum; and

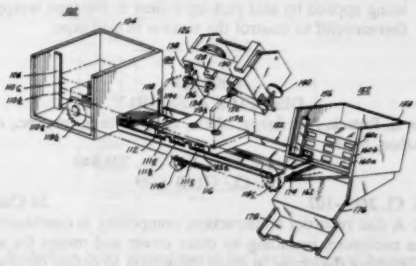
at least one impedance roller having a peripheral portion making contact with the tape thus loaded in said predetermined tape travel path and rotating with a peripheral speed equal to a travel speed of the tape in said predetermined tape travel path, thereby stabilizing the travel speed of the tape responsive to a rotational inertia of the impedance roller.

4,092,685

CASSETTE CHANGER APPARATUS HAVING PRIORITY EJECT

Willy M. Sander, Stamford, and Andre T. Debaudringhien, Bridgeport, both of Conn., assignors to Dictaphone Corporation, Rye, N.Y.

Filed Sep. 10, 1976, Ser. No. 722,143
Int. Cl.[2] G11B *23/04, 15/68*
U.S. Cl. 360—92 **6 Claims**



1. Record and/or playback apparatus comprising an input supply of magnetic tape cassettes, an output store for said cassettes spaced from said input supply, a record/playback

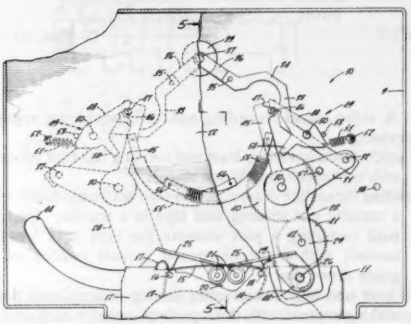
station intermediate said input supply and output store, conveyor means for conveying individual cassettes from said supply to said record/playback station and thence to said output store, a discharge chute for receiving a cassette conveyed from said record/playback station to said output store, an elevator disposed above said discharge chute for receiving a conveyed cassette and lifting same into said output store, said elevator normally being conditioned to intercept said conveyed cassette and prevent same from being received by said discharge chute; and means for selectively displacing said elevator before said conveyed cassette is intercepted thereby; whereby said conveyed cassette is discharged from said apparatus by said chute when said elevator is displaced.

4,092,686

TAPE WITHDRAWAL AND TENSIONING MECHANISM FOR VIDEO CASSETTE RECORDER/REPRODUCER

Gordon Schulz, Villa Park, Calif., assignor to Odetics, Inc., Anaheim, Calif.

Filed Feb. 17, 1976, Ser. No. 658,689
Int. Cl.[2] G11B *5/008*; B65H *17/48*; G11B *15/66*
U.S. Cl. 360—95 **27 Claims**



1. A mechanism for withdrawing tape from a video cassette to prepare said tape for threading around a video scanner and for controlling the tension in said tape comprising:

a pair of compliance arms;

a tape pick-up roller mounted on one end of each compliance arm;

means for mounting the other ends of said compliance arms for pivotal movement between first positions wherein said pick-up rollers are behind said tape when said tape is fully retracted within said video cassette and second positions wherein said tape is withdrawn from said cassette in two diverging directions, said compliance arms being freely, angularly pivotable in said second positions; and

means for applying an angularly-directed force to said compliance arms when in said second positions, said force being applied by said pick-up rollers to the tape wrapped therearound to control the tension in said tape.

4,092,687

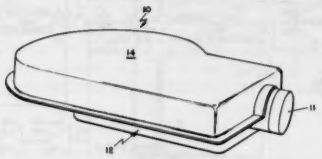
DISC FILE ASSEMBLY

Otto R. Butsch, Ann Arbor, Mich., assignor to Sycor, Inc., Ann Arbor, Mich.

Filed Sep. 7, 1976, Ser. No. 721,040
Int. Cl.[2] G11B *5/48*
U.S. Cl. 360—102 **30 Claims**

1. A disc recorder construction, comprising in combination:

an enclosure, including an outer cover and means for supporting the cover in place thereupon to define therewith an enclosed structure, and including means for sealing the cover and support means to one another such that said enclosure is substantially sealed from air external to the enclosure; means defining a single main flow path for air within said enclosure; a recording disc and means mounting the same for rotation within said enclosure, said disc located with its recording surfaces at least partially within said main air flow path; means for rotating said disc within said enclosure, at least portions of said disc-rotating means being disposed within the enclosure and directly within said main air flow path, so that air moving in said path directly encounters said portions of said disc-rotating means while the air moves along such path; and air-impelling means for moving air within said enclosure along said main air flow path, the air which moves along said main air flow path passing over at least portions of said recording disc as well as over at least said portions of the means for rotating said disc, to cool the latter and also to facilitate recording, such as by providing a boundary air flow adjacent the disc for an aerodynamic transducer head and for removing dust particles or the like from the area of the disc.

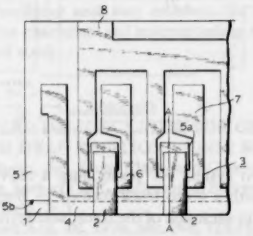


4,092,688

MULTI-TRACK THIN FILM MAGNETIC HEAD

Noboru Nomura, Kyoto; Kenji Kanai, Neyagawa; Nobuyuki Kaminaka, Moriguchi, and Norimoto Nouchi, Katano, all of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Kadoma, Japan

Filed Jul. 27, 1976, Ser. No. 709,102
Claims priority, application Japan, Jul. 31, 1975, 50-94029; Jul. 31, 1975, 50-94030
Int. Cl.[2] G11B *5/28, 5/20, 5/47*
U.S. Cl. 360—121 **9 Claims**



1. A multi-track thin film magnetic head having a plurality of unit magnetic heads and comprising:

a first generally plane magnetic material layer;

a plurality of first elongated flat plane conductor layers deposited in a row on said first magnetic material layer and spaced from each other in the direction of the length of said row and each being in the shape of an inductive loop for a respective unit magnetic head;

a second elongated conductor layer deposited on said first magnetic material layer and extending along said row and adjacent to and spaced from said plurality of first conductor layers for leaving gaps between each of said first conductor layers and said second conductor layer;

a plurality of separate second magnetic layers, one for each first conductor layer, deposited over said first and second

conductor layers at positions along said row corresponding to the positions of said first conductor layers and being magnetically coupled to said first magnetic material layer through the loops of the respective first conductor layers; and

a thickness of magnetically insulating material at each of said gaps and having a dimension in the direction of the spacing between said first and second magnetic material layers, whereby said first and second magnetic material layers are sufficiently magnetically insulated from each other to prevent magnetic flux short-circuiting.

4,092,689

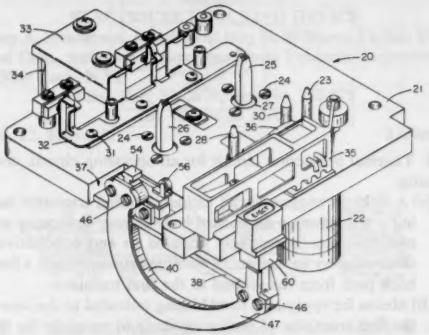
CARTRIDGE EJECTING MECHANISM

Frank H. Kaufholz, Jr., Havertown, Pa., assignor to Computer Peripherals, Inc., Rochester, Mich.

Filed Nov. 15, 1976, Ser. No. 742,029

Int. Cl.² F16C *1/10, 1/16*

U.S. Cl. 360—137 **14 Claims**



1. An ejector mechanism comprising

(a) support means positioned adjacent a movable member;

(b) an open-ended slot located within said support means having one end in communication with the movable member, the slot having linear and non-linear portions;

(c) and an actuator member formed of an elastic material to be coextensive with said slot when in a home position and having corresponding linear and non-linear portions, said actuator member slidably mounted within said slot for movement from a home position to an actuated position engaging and ejecting said movable member wherein the linear and non-linear portions of the actuator member are deformed by the corresponding linear and non-linear portions of the slot upon movement of the actuator member through the linear and non-linear portions of the slot, said deformed portions biasing the actuator member for a return movement to the home position within the slot.

4,092,690

PROTECTIVE RELAY CIRCUIT PROVIDING A COMBINED DISTANCE AND OVERCURRENT FUNCTION

Stanley B. Wilkinson, Havertown, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Jan. 31, 1977, Ser. No. 764,302

Int. Cl.² H02H *3/28*

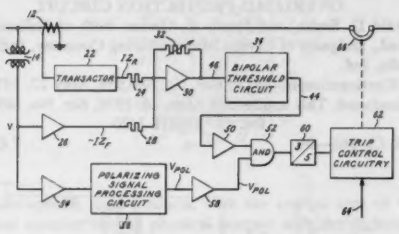
U.S. Cl. 361—80 **24 Claims**

1. A protective relay circuit for providing a combination distance and overcurrent relay function for controlling the trip coil of a circuit breaker protecting an alternating current power transmission line, comprising:

difference circuit means for producing a difference signal proportional to the difference between a signal proportional to an a-c power line current multiplied by a preselected constant reference impedance and a signal proportional to line voltage;

an alternating current level detector responsive to the difference signal from said difference circuit means for producing an output signal when said difference signal exceeds a predetermined threshold value representative of a preselected parameter of said power line;

means for generating a voltage polarity signal from a line voltage signal of said alternating current power transmission line;



coincidence detector means for producing a coincidence signal output in response to detecting coincidence between the output of said alternating current level detector and the voltage polarity signal;

coincidence-responsive means for receiving said coincidence signal output and being operative, when enabled, to effect operation of said trip coil in response to a coincidence signal output of a predetermined minimum duration; and

said protective relay circuit permitting production of an effective coincidence signal output only if said difference signal exceeds said predetermined threshold value.

4,092,691

PROTECTIVE RELAY ARRANGEMENTS

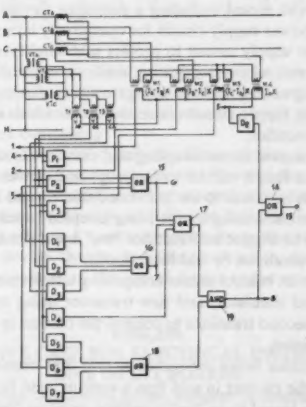
Anthony Williams, Newport, England, assignor to The General Electric Company Limited, London, England

Filed Nov. 10, 1976, Ser. No. 740,369

Claims priority, application United Kingdom, Nov. 14, 1975, 47083/75

Int. Cl.² H02H *3/38*

U.S. Cl. 361—80 **7 Claims**



1. A starting relay arrangement for use in a power transmission protection system, and including means for detecting unbalanced faults, comprising phase detection means for detecting phase angles, in excess of a predetermined value, between associated line voltages and currents, voltage detection

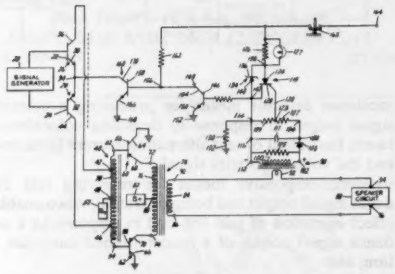
means responsive to line-to-line voltages below a threshold value, said threshhold value being the minimum value of any line-to-line voltage at which a phase angle in excess of said predetermined value can be detected, and fault output means independently operable by said phase detection means and said voltage detection means.

4,092,692

OVERLOAD PROTECTION CIRCUIT

Gerald D. Smith, and Frank R. Owens, both of Indianapolis, Ind., assignors to Carson Manufacturing Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 580,955, May 27, 1975, abandoned. This application Mar. 24, 1976, Ser. No. 669,994
Int. Cl.[2] H02H *7/20*
U.S. Cl. 361—94 7 Claims



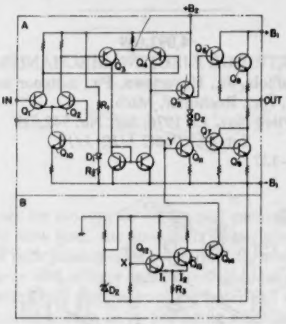
1. Overload protective circuitry comprising:
an audio amplifier having an output stage;
a load circuit coupled to said output stage;
current sensing means for generating an overload signal in response to an overload in said load circuit;
circuit means for disabling said amplifier in response to said overload signal;
coupling means for coupling said load circuit to said current sensing means and for isolating said load circuit from d.c. currents in said circuit means, said coupling means imparting negligible impedance to said load circuit;
said output stage includes at least one amplifying device;
a power supply circuit coupled to said amplifying device;
said circuit means including a switching device coupled to said power supply circuit for operatively interrupting said power supply circuit to protect said amplifying device;
said circuit means comprising a silicon controlled rectifier having anode, cathode and gate electrodes;
a current supply circuit connected to the anode electrode of said rectifier;
circuit control means coupling said cathode electrode to said power supply circuit to interrupt said power supply circuit in response to an "on" condition of said rectifier;
said current sensing means being coupled to said gate electrode to trigger said rectifier "on" upon sensing an overload condition in said load circuit;
said circuit control means comprising a first transistor and a second transistor, said first transistor being connected to said second transistor to control the current in said second transistor;
said rectifier being connected to said first transistor to control the current in said first transistor, said first transistor being biased to an "on" condition upon an "on" condition of said rectifier and the second transistor being biased "off" upon an "on" condition of said first transistor; and
said second transistor being series connected in said power supply circuit to interrupt said power supply circuit when said second transistor is in an "off" condition.

4,092,693

TEMPERATURE SENSING PROTECTION CIRCUIT FOR IC POWER CHIP HAVING THERMAL HYSTERESIS CHARACTERISTIC

Katsumi Ishikawa, and Akio Ozawa, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 11, 1977, Ser. No. 776,810
Claims priority, application Japan, Mar. 12, 1976, 51-26060
Int. Cl.[2] H02H *5/04*
U.S. Cl. 361—103 6 Claims



1. Thermal protection circuit for an operating circuit, comprising:
(a) A Schmitt trigger circuit including a first transistor having a temperature dependent base-emitter voltage, a second transistor operatively coupled to and conductively controlled by the output of the first transistor, and a feedback path from the second to the first transistor,
(b) Means for applying a fixed biasing potential to the base of the first transistor of such magnitude to maintain the first transistor in a non-conductive state under normal operating conditions of said operating circuit,
(c) Means thermally coupling the first transistor with the operating circuit, and
(d) Means coupled between the trigger circuit and the operating circuit for disabling the latter in response to a reversal in the conductive states of the first and second transistors, whereby the first and second transistors become conductive and non-conductive, respectively, when the temperature of the operating circuit rises to a first predetermined level at which the base-emitter voltage of the first transistor drops below its effective biasing potential, and wherein the first transistor is again cutoff when the temperature of the operating circuit drops to a second predetermined level.

4,092,694

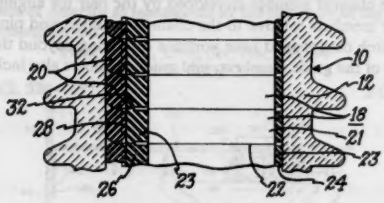
OVERVOLTAGE SURGE ARRESTER HAVING LATERALLY BIASED INTERNAL COMPONENTS

Earl W. Stetson, Pittsfield, Mass., assignor to General Electric Company

Filed Mar. 16, 1977, Ser. No. 778,006
Int. Cl.[2] H02H *9/06*
U.S. Cl. 361—126 7 Claims

1. An electrical overvoltage surge arrester, comprising:
a hollow insulating housing cylinder with conductive electrical terminal members;
a plurality of internal components disposed in said housing and closely stacked longitudinally therein with first contact surfaces of first perimeter portions resting against an inside wall of said housing;
second, bias surfaces on second perimeter portions of said

components, said bias surfaces extending longitudinally in said housing and



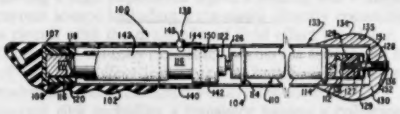
resilient electrically insulating bias members disposed in a deformed, stressed state against said bias surfaces and forcing said first surfaces against said wall.

4,092,695

ELECTRICAL SHOCKING DEVICE

Gary A. Henderson, Arvada, and Guy H. Williams, Parker, both of Colo., assignors to American Home Products Corporation, New York, N.Y.

Filed Dec. 20, 1976, Ser. No. 752,575
Int. Cl.² F41B *15/04*
U.S. Cl. 361—232 **3 Claims**



1. A hand-held electrical shocking device which in the energized operative condition produces a visible and audible external spark and delivers a jolting electrical shock when contacting the skin, comprising in combination:

a. A conductive, hollow, tubular housing having an insulating hand grip at one end and forming a first plate;

b. At least one second plate connected to the surface of said housing by an electrically insulating material in spaced apart relation to said housing;

c. A low direct voltage power source positioned within said housing and adapted to be electrically connected to said housing by a switch;

d. A hollow, tubular member positioned within said housing and containing an electronic circuit means coupled to said power source and said housing, said electronic circuit means being adapted to provide a series of short duration, high voltage, low current electrical impulses to said first and second plates.

4,092,696

VARIABLE AREA CAPACITIVE PRESSURE TRANSDUCER WITH TEMPERATURE COMPENSATION

George Francis Boesen, Park Ridge, and Peter Lawrence Kay, Arlington Heights, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 27, 1976, Ser. No. 754,380
Int. Cl.² H01G *5/34*
U.S. Cl. 361—283 **7 Claims**

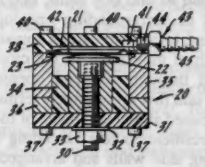
1. A transducer assembly comprising:

a first, substantially flat, electrically conductive member, capable of deformation, having a central area and a peripheral area, and having a corrugation adjacent its peripheral area;

a second electrically conductive member, substantially rigid and resistant to deformation, having an apex point on one surface;

a thin-film dielectric layer on one of the first and second electricallly conductive members; and

a housing for maintaining the first electrically conductive member, the dielectric layer, and the second electrically conductive member in engagement, including means for clamping the peripheral area of the first member in a



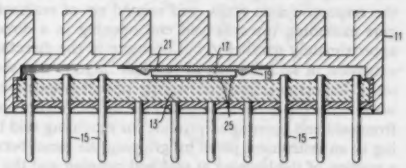
substantially rigid position, with the central area of the first member having physical contact with the dielectric layer at the apex point of the second electrically conductive member to provide a capacitor assembly, such that application of a force to the first electrically conductive member deforms the central area of this member to change the effective contact area of the first and second electrically conductive members.

4,092,697

HEAT TRANSFER MECHANISM FOR INTEGRATED CIRCUIT PACKAGE

Ronald Neil Spaight, Vestal, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 6, 1976, Ser. No. 748,077
Int. Cl.² H05K *7/20*
U.S. Cl. 361—386 **7 Claims**



1. In an integrated circuit assembly including at least one circuit device mounted on a circuitized substrate with a cover mounted on said substrate to enclose said circuit device, the improvement comprising:

a formable electrically insulative film enclosing a thermally conductive material between said film and the underside of said cover, said film being secured at its periphery to said cover, whereby said film is brought into direct contact with and conforms generally to the top of said circuit device, thereby providing a direct conductive heat transfer path from the circuit device to the cover.

4,092,698

PROTECTIVE CASE FOR ELECTRICAL INSTRUMENTS ON CIRCUIT BOARDS

Paul E. Brefka, Southboro, Mass., assignor to Analog Devices, Incorporated, Norwood, Mass.

Continuation of Ser. No. 723,780, Sep. 16, 1976, abandoned. This application Jul. 1, 1977, Ser. No. 812,059
Int. Cl.² H05K *5/00*
U.S. Cl. 361—399 **11 Claims**

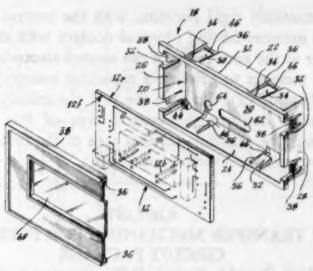
1. A protective case for a panel-mounted electrical instru-

ment of the type having internal electrical circuitry on a circuit board, said protective case comprising:

a housing having four side walls disposed about and at right angles to an end wall, said housing also being formed with an end opening opposite said end wall;

ledge means formed within the housing adjacent the side walls thereof, the surfaces of said ledge means facing said end opening providing a planar support for the circuit board;

a first set of resilient fingers formed integrally with an opposed pair of said side walls, said first set of fingers being located in corresponding openings in said pair of side walls and formed to extend towards said end wall along the path of movement of the circuit board as it is being inserted through said end opening towards said ledge means, said first set of fingers terminating in bevelled front faces spaced above said plane of the ledge means; said first set of resilient fingers extending inwardly of the corresponding side walls and arranged to fit against the outward side surface of the circuit board when its inward side surface is in contact with said ledge means;



a second set of resilient fingers formed integrally with an opposed pair of said side walls of the housing, said second set of fingers being formed in corresponding openings in the respective side walls, said second set of resilient fingers extending towards said end opening in a direction approximately parallel to but opposite to the direction of extension of said first set of resilient fingers, said second set of fingers extending outwardly of said respective side walls with the ends of said second set of fingers spaced from said end opening to provide for mounting said housing to an instrument panel by gripping the panel between a portion of the housing at said end opening and the ends of said second pair of resilient fingers;

whereby all assembly steps for the case, comprising mounting the circuit board in the case and securing the case in a panel, may be performed without resort to separate fastening means or tools.

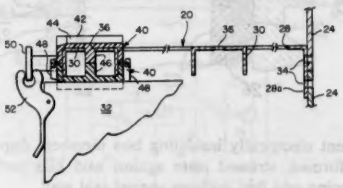
4,092,699

SIMPLIFIED RACK FOR ELECTRONIC COMPONENTS

Amedio D. Petrangelo, Rochester, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Jul. 5, 1977, Ser. No. 812,574
Int. Cl.[2] H02B 1/02
U.S. Cl. 361—415 **2 Claims**

1. A rack for supporting objects generally similar to printed circuit cards and other plug-in electronic components in spaced, parallel alignment comprising a plurality of generally rectangular open-work shelves, and four corner posts integrally joined to said shelves adjacent to their corners, each of said shelves including a plurality of longitudinal channel members, each of said channel members having a perforation at a predetermined location, and guide members formed as split sleeves fitted on said channel members and closely enveloping them, each of said guide members including outer bosses defining transverse slots for receiving and guiding edge portions of objects to be supported and an inwardly extending combination latch and alignment pin, the alignment pin of one of each pair of said guide members extending through the perforation in the channel member enveloped by the pair for aligning the guide members relative to the channel member, said pins having latch cam shaped nose portions extending beyond the side walls of the guide members, said guide members also including



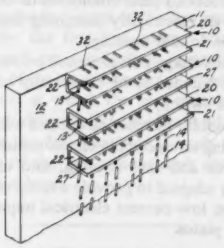
detent dogs on the outer surfaces of their side walls, the arrangement being such that when the two guide members of each pair are placed together with the edges of the side walls of one abutting the edges of the side walls of the other and the members are moved lengthwise relative to each other their pins latch and their dogs engage to hold the guide members together and prevent relative translation.

4,092,700

TELEPHONE CONNECTOR BLOCK GUIDE

Paul V. De Luca, Port Washington, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.

Filed Aug. 23, 1976, Ser. No. 716,434
Int. Cl.[2] H02B 9/00
U.S. Cl. 361—428 **4 Claims**

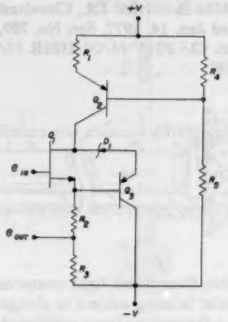


1. In combination, a telephone connector block having an exposed planar surface and a plurality of conductive pins projecting outwardly from said surface; and a conductor wire guide comprising a unitary body of non-conductive synthetic resinous material having a principal axis, said body having an axially oriented base wall having inner and outer surfaces and a plurality of resilient pin-engaging openings extending through said base wall between said inner and outer surfaces; said base wall having first and second longitudinal edges, first and second side walls extending laterally from said first and second edges, said side walls having third and fourth longitudinally extending mutually parallel free edges; said guide being frictionally engaged upon said pins, whereby said side walls define an interstice within which conductors may be engaged upon at least some of said pins.

4,092,701
ULTRA HIGH INPUT IMPEDANCE/VOLTAGE RANGE AMPLIFIER

Jon H. Bumgardner, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 8, 1976, Ser. No. 748,594
Int. Cl.² H03F 3/04
U.S. Cl. 330—297 **2 Claims**

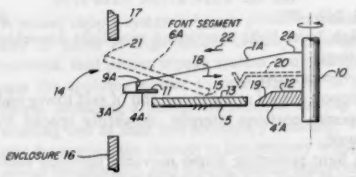


1. A high impedance amplifier comprising:
a field effect transistor connected as a source follower and having a high impedance input, a source, and a drain;
a current source including a transistor directly connected in a circuit with the drain of said field effect transistor;
a Zener diode directly connected across the source and drain of said field effect transistor and being reverse biased to maintain a predetermined voltage thereacross;
a current sink including a transistor having a collector, an emitter directly connected to said Zener diode, and a base directly connected to the souce of said field effect transistor; and
impedance means directly connected between said source of said field effect transistor and the collector of the transistor current sink for providing an impedance matched output therefor, whereby said high impedance amplifier is protected from high voltage transents appearing at the high impedance input of said field effect transistor.

4,092,702
FONT SEGMENT FRONT LOADING DEVICE

Peter R. Ebner, South Nashua, N.H., assignor to Itek Corporation, Lexington, Mass.

Filed Mar. 17, 1977, Ser. No. 778,754
Int. Cl.² G03B 17/06, 17/10, 17/18
U.S. Cl. 354—15 **12 Claims**

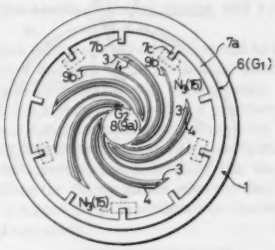


1. In a font support device for supporting font segments for a phototypesetting machine comprising:
a. a rotatable hub member for supporting outwardly and radially extending segment support arms coupled to said hub member at positions so that adjacent support arms define a plurality of sectors for containing a plurality of font segments;
b. vertically oriented inwardly facing precision machined font segment alignment reference shoulder portions formed upon outer portions of said arms for radially referencing said segments through the use of centrifugal force;
c. first horizontal support means having upper surfaces positioned within a first font segment support plane and coupled to said outer portions of said arms for supporting said segments against gravity;
d. second horizontal support means coupled to said hub member for supporting said segments against gravity, and having upper surfaces in substantially the same first font segment support plane as the upper surfaces of said first horizontal support means, the improvement comprising:
e. a stationary stage plate having an upper surface thereof lying in a second font segment support plane below said first font segment support plane, for supporting said font segments during insertion and removal, together with guide means for guiding the leading edges of said font segments between contact with said stationary stage plate and contact with said second support means during insertion of said font segment into said font support device.

4,092,703
GATE CONTROLLED SEMICONDUCTOR DEVICE

Tetsuro Sueoka, Tokyo, and Satoshi Ishibashi, Higashimine, both of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Mar. 15, 1977, Ser. No. 777,844
Int. Cl.² H01L 29/74
U.S. Cl. 357—38 **16 Claims**



1. A gate controlled semiconductor device comprising a semiconductive element having at least two P-N junctions formed between a P-type diffused region and an N-type diffused region on a disc-shaped wafer a cathode electrode divided into a plurality of cathode electrode assemblies, each assembly including a radial and spiral-shaped metallic layer on a radial and spiral-shaped cathode-emitter layer formed on a surface of said semiconductive element, an anode electrode, and a gate electrode including a plurality of separated gate electrode assemblies on the surface of said semiconductive element so as to surround said cathode electrode, said plurality of gate electrode assemblies comprising a first gate electrode assembly having a plurality of projections opposite to said cathode electrode assemblies and a second gate electrode assembly in the opposite side with respect to said first gate electrode assembly and opposite to said plurality of cathode electrode assemblies so that the facing length of the second gate electrode assembly is longer than the facing length of the first electrode assembly to said plurality of cathode electrode assemblies.

4,092,704

HEADGEAR LIGHT

Douglas E. Malm, 2031 W. Palmyra, Apt.C., Orange, Calif. 92668

Filed Sep. 7, 1977, Ser. No. 831,244
Int. Cl.[2] F21L *15/14*
U.S. Cl. 362—106 10 Claims

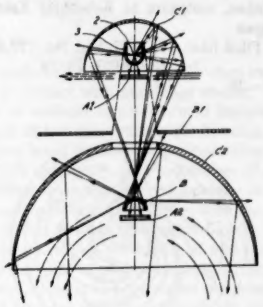
1. In combination with an item of headwear, such as a helmet, a light unit comprising a housing secured to an extending forwardly from the headwear item, said housing having a forwardly opening window and a downwardly opening window, an electric light source mounted within said housing rearwardly of said windows and facing toward said front window, a current source electrically connected to said light source and supported by said headwear item, a mirror, and means swingably mounting said mirror within said housing for movement between said windows, said mirror in one position forming a shutter over said front window and a reflector for reflecting the light rays from the light source through said bottom window.

4,092,705

METHOD OF ILLUMINATING AN OBJECT AND A DEVICE FOR CARRYING OUT THE METHOD

Karl Johan Folke Högbert, Uppsala, Sweden, assignor to Medical Products Octagon AB, Uppsala, Sweden

Continuation of Ser. No. 511,862, Oct. 3, 1974, abandoned, which is a continuation of Ser. No. 400,572, Sep. 25, 1973, abandoned. This application July 29, 1975, Ser. No. 600,038
Claims priority, application Sweden, Sep. 29, 1972, 7212663
Int. Cl.[2] F21V *29/00*
U.S. Cl. 362—294 1 Claim



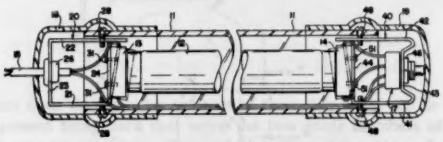
1. In an apparatus for illuminating an object, including a light source which emits energy including visible light and radiant heat, and a first reflector disposed in spaced relationship with respect to said object to be illuminated, the improvement comprising: a screening body disposed between said light source and said object to be illuminated and in the path of direct transmission of said emitted energy from said light source to said object to be illuminated, said screening body preventing substantially all of said emitted energy from directly reaching said object to be illuminated by reflecting substantially all of said visible light, following said path of direct energy transmission, back to said first reflector and absorbing substantially all of said radiant heat, following said path of direct energy transmission, heat transmission means operatively associated with said screening body to lead said heat absorbed by said screening body out of said path of direct energy transmission, said light source being spatially disposed between said reflector and said screening body, a convex, second, larger reflector, having an aperture therein sufficiently large to pass reflected energy from said first reflector, disposed between the screening body and the object to be illuminated and oriented with its concave surface thereof facing said object to be illuminated, a convex mirror disposed within said second reflector with its convex surface receiving said reflected energy from said first reflector to reflect substantially all of the visible light of said reflected energy, and an absorption body disposed in said path of said reflected energy between said convex mirror and said object to be illuminated to absorb substantially all of the heat energy of said reflected energy.

4,092,706

PORTABLE FLUORESCENT LIGHT

Gary W. Vest, 4483 Broadview Rd., Cleveland, Ohio 44109

Filed Jan. 14, 1977, Ser. No. 759,423
Int. Cl.[2] F21V *15/04;* H01R *33/12*
U.S. Cl. 362—390 1 Claim



1. In a portable fluorescent light comprising an elongated transparent tubular housing subject to elongation due to thermal expansion, a fluorescent lamp positioned in said housing, and electrical circuit means, including two fluorescent lamp sockets, for energizing said lamp, the improvement which comprises:

a pair of socket supports for mounting said sockets to said housing, each socket support comprising an elongated strip of metal bent into a four-legged, generally rectangular shape with two parallel side legs connected at opposed locations to said housing, an outer leg connected between said side legs and a flexible resilient inner leg that supports the respective socket, said inner leg being connected to one of said side legs and being adapted to flex in a direction parallel to the axis of said fluorescent lamp between an inwardly extending relaxed position and a flexed retracted operating position generally perpendicular to said side legs, whereby when said lamp is connected to said sockets and positioned in said tube, said respective inner legs are flexed in a direction parallel to the axis of said fluorescent lamp to their operating position to apply a tight holding force to said lamp and to accommodate elongation due to thermal expansion of said housing to which the socket supports are attached.

4,092,707

HIGH LEVEL LIGHT SUPPORTING AND LIGHT LOWERING MEANS

Paul A. Millerbernd, Winsted, Minn. 55395

Filed Nov. 8, 1976, Ser. No. 739,831
Int. Cl.[2] F21V *21/36;* F21S *1/10*
U.S. Cl. 362—391 9 Claims

1. High level light supporting and light lowering means comprising:

(a) a vertical tower;

(b) support means at the upper end of said tower and having opposite portions laterally outwardly spaced from said tower;

(c) a light mounting frame movable between substantially ground level and said support means;

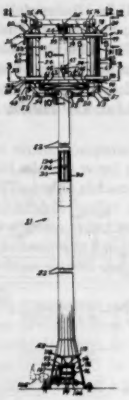
(d) latch means for releasably locking said frame to said support means;

(e) a carriage underlying said frame and vertically movable independently of said frame, said carriage having frame engaging portions for supporting said frame and for holding said frame and carriage against pivotal movement relative to each other about the axis of said tower;

(f) elevating means for raising and lowering said carriage between substantially ground level and an upper position

near the top of said tower and independently of said frame when said frame is latched to said support means;

(g) and automatic latch-operating means on said carriage and



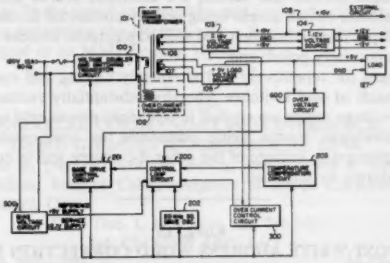
said frame operative responsive to predetermined relative vertical movements between said carriage and frame to release said latch means, whereby said frame may be lowered toward ground level with said carriage.

4,092,708

POWER SUPPLY WITH OVERCURRENT PROTECTION

James H. Gerding, Framingham, and Albert M. Heyman, Bedford, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 29, 1976, Ser. No. 755,392
Int. Cl.[2] H02M *1/18*
U.S. Cl. 363—56 **12 Claims**



1. A power supply system wherein power is transmitted to a plurality of loads at high speed, thereby causing potential overcurrents, said power supply system comprising:

means for applying power to said plurality of loads, said means including a power transformer having a primary winding and at least one secondary winding;

means for sensing the current in the primary winding of said power transformer, said sensing means being connected in series with the primary winding of said power transformer, said sending means being operative to indicate an overcurrent condition, said indication being a grounding signal; and

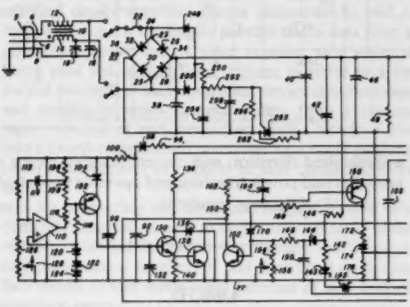
control means, coupled to said current sensing means, for controlling said means for applying power, said control means including means, responsive to the sensing of the grounding signal, for rapidly reducing the application of power and thereafter slowly increasing the application of power.

4,092,709

MULTIPLE OUTPUT SELF OSCILLATING CONVERTER REGULATOR POWER SUPPLY

William C. Voigt, and William F. Jergens, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 24, 1976, Ser. No. 726,375
Int. Cl.[2] H02M *3/315*
U.S. Cl. 363—18 **11 Claims**



1. A regulated power supply circuit having an energy storage cycle and an energy transfer cycle comprising:

(a) DC voltage input means for receiving an input voltage;

(b) power switching means connected to the input means to close and provide power during the energy storage cycle and to open during the energy transfer cycle;

(c) a transformer having a primary winding connected to the input means through the power switching means to permit current flow during the energy storage cycle, at least one secondary winding, biased to permit current flow only during the energy transfer cycle, a base drive winding to drive the power switching means, and a sense winding; and

(d) feedback means operatively connected to the sense winding which includes a current sinking means for opening the power switching means, timing means for turning on the current sinking means after a predetermined delay, a reference capacitor operatively connected with the sense winding, a high gain voltage comparison means connected with the reference capacitor and the timing means for controlling the timing means whereby the current sinking means is turned on in dependence on the voltage variation on said capacitor.

4,092,710

LASER POWER SUPPLY

Gary Earl Wadsworth, Little Rock, Ark., assignor to Power Technology, Inc., Little Rock, Ark.

Filed Dec. 7, 1976, Ser. No. 748,317
Int. Cl.[2] H02M *3/335*
U.S. Cl. 363—19 **12 Claims**

1. A high voltage supply circuit, comprising:

an input for connection to a low voltage dc supply and an output for connection to a laser;

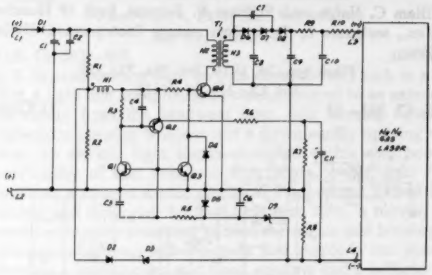
a dc to dc converter connected to said input and including power transistor means operable in response to the application of low dc voltage to produce a converter output signal;

voltage increasing means connected to said output;

coupling means connected between said converter and said voltage increasing means coupling said converter signal to said voltage increasing means, said coupling means including a feedback connection to the input side of said converter to provide an increase in the drive of said power transistor means; and

constant current regulation means including current sensing

means connected to said power transistor and current hogging means including a pair of transistors connected as



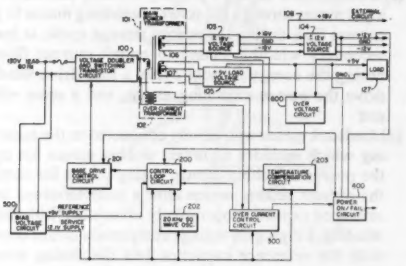
a synthesized thyristor, said current hogging means connected to said power transistor and operable to control the on time of said power transistor.

4,092,711

POWER SUPPLY WITH AUTOMATIC SHUTDOWN

James H. Gerding, Framingham, and Albert M. Heyman, Bedford, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 29, 1976, Ser. No. 755,393
Int. Cl.[2] H02M *1/18*
U.S. Cl. 363—53 **15 Claims**



1. A power supply system for providing a signal to an electronic device indicative of the status of the power being supplied, said power supply system comprising:

means for converting an AC voltage to a first DC voltage level;

means for transforming the first DC voltage level to the low-level DC voltage;

means for sensing the low-level DC voltage appearing at the output of said transforming means; and

means, responsive to the sensing of the low-level DC voltage, for generating a status signal having a first signal level prior to the power supply system having been turned on and having a second signal level at such time as the sensed low-level DC voltage reaches a first predetermined voltage, and again having the first signal level if the sensed low-level DC voltage falls below a second predetermined voltage; said status signal generating means comprising:

means for storing a voltage representative of the sensed low-level DC voltage;

means for comparing the voltage representative of the sensed low-level DC voltage with at least two reference voltages; and

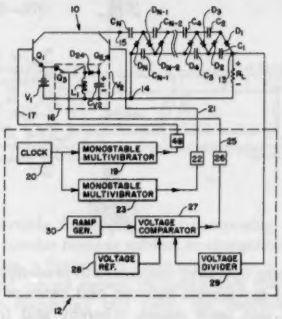
means for defining the signal level of the status signal in response to the comparisons with reference voltages by said comparison means.

4,092,712

REGULATED HIGH EFFICIENCY, LIGHTWEIGHT CAPACITOR-DIODE MULTIPLIER DC TO DC CONVERTER

William T. Harrigill, Jr., Brunswick, and Ira T. Myers, Westlake, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 27, 1977, Ser. No. 801,432
Int. Cl.[2] H02M *7/00*
U.S. Cl. 363—60 **13 Claims**



1. A d-c to d-c converter comprising:

a capacitor-diode multiplier having input means for connection to a source of electrical energy and output means for connection to a load;

first and second d-c electrical sources, said second d-c electrical source being a capacitor;

means for supplying unidirectional voltage pulses to said capacitor to produce d-c voltage thereon;

first and second switch means, said first d-c electrical source and said first switch being serially connected across said input means, said second d-c electrical source and said second switch means being serially connected across said input means, said first and second electrical sources being oppositely poled; and

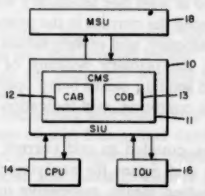
means for repetitively and alternately closing and opening each of said switches whereby substantially rectangular voltage pulses are applied to said input means, said second electrical source being adjustable to compensate for changes in voltage of the other d-c source and in current drawn by said load.

4,092,713

POST-WRITE ADDRESS WORD CORRECTION IN CACHE MEMORY SYSTEM

James Herman Scheuneman, St. Paul, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Jun. 13, 1977, Ser. No. 805,686
Int. Cl.[2] G06F *11/08*
U.S. Cl. 364—200 **4 Claims**



1. In an electronic data processing system that utilizes a high speed cache memory system intermediate a shared slow speed

main storage unit and a plurality of requestors, which cache memory system includes an address buffer and a data buffer having set-associated addressable locations selected by a requestor furnished address word, the combination comprising:

a cache memory system including an address buffer and a data buffer having set-associated addressable locations in each of which in said address buffer are stored a plurality of address words and in said data buffer are stored a like plurality of associated blocks of data words;

an address word register for storing a requestor address word having a block address word and a set address word associated therewith;

an uncorrected address word comparator coupled to said address buffer and said address word register for comparing the address words stored in the set-associated addressable location in said address buffer selected by the set address word in said address word register to the block address word in said address word register and generating alternative Match or Miss signals indicative of said comparison;

error correction circuitry coupled to said address buffer for error correcting errors in the address words stored in the set-associated addressable location in said address buffer selected by the set address word in said address word register and generating corrected address words therefrom;

a corrected address word comparator coupled to said error correction circuitry for comparing said corrected address words to the block address word in said address word register and generating alternative Match or Miss signals indicative of said comparison;

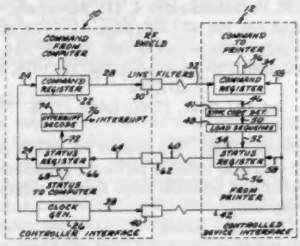
parity checking means coupled to said address buffer for checking the parity of the address words stored in the set-associated addressable location in said address buffer selected by the set address word in said address word register and generating alternative Good Parity or Bad Parity signals therefrom; and,

means responsively coupled to said Match or Miss signals generated by said uncorrected address word comparator and to said Good Parity signal generated by said parity checking means or to said Match or Miss signals generated by said corrected address word comparator and to said Bad Parity signal generated by said parity checking means for generating the alternatively a Request Acknowledge signal or an MSU Request signal.

4,092,714
PARALLEL COMMAND-STATUS INTERFACE THROUGH MULTIPLEXED SERIAL LINK

Thomas R. Norton, Newport Beach, and Stephen I. Geller, Pasadena, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 1, 1976, Ser. No. 746,562
Int. Cl.² G06F *3/00, 3/12*
U.S. Cl. 364—200 **16 Claims**



1. Apparatus for interconnecting a controller and a controlled device to transmit parallel data commands from said controller to said controlled device and to transmit parallel status data from said controlled device to said controller, said apparatus comprising:

controller interface means connected to said controller for reading-in parallel command data from said controller into a first register, said command data being read-out in series from said first register to a command output terminal of said controller interface means, and reading-in series status data from a status input terminal of said controller interface means into a second register, said status data being read-out in parallel from said second register to said controller;

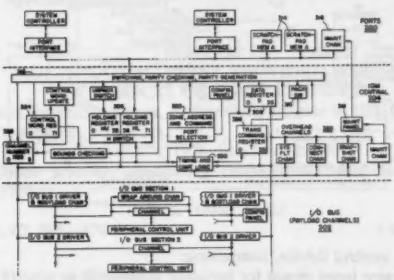
controlled device interface means connected to said controlled device for reading-in parallel status data from said controlled device into a third register, said status data being read out of said third register in series to a status output terminal of said controlled device interface means, and reading-in series command data from a command input terminal of said controlled device interface means into a fourth register, said command data being read out of said fourth register in parallel to said controlled device; and

means for connecting said command output terminal of said controller interface means to said command input terminal of said controlled device interface means, and connecting said status output terminal of said controlled device interface means to said status input terminal of said controller interface means.

4,092,715
INPUT-OUTPUT UNIT HAVING EXTENDED ADDRESSING CAPABILITY

Robert Edmund Scriver, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Sep. 22, 1976, Ser. No. 726,019
Int. Cl.² G06F *9/10*
U.S. Cl. 364—200 **1 Claim**



1. In an electronic data processing system including a memory, a central processing unit, an input-output unit having a plurality of peripheral channels, a plurality of peripheral devices each communicating with said central processing unit and said memory through one of said peripheral channels of said input-output unit, and a system controller for coordinating the operation of said memory, said central processing unit, and said input-output unit, the method of addressing paged data in said memory by said input-output unit wherein such paged data may have absolute addresses greater than the address field of the control words used to access such paged data, said method comprising the steps of:

a. storing data in said memory in pages, each page comprising a plurality of contiguous, finite memory locations and each page being identified by a page table word,

b. establishing in said memory a page table for each of said peripheral channels, each page table including a plurality of page table words, each page table further including first and second portions, said first portion containing page table words identifying pages in a first address space of said memory, said second portion containing page table words identifying pages in a second address space of said

memory, said first and second address spaces being non-overlapping,

c. assigning a peripheral control word to one of said peripheral channels, said peripheral control word including as a portion thereof a page table pointer for identifying the location in said memory of the beginning of the page table established for said one peripheral channel,

d. storing the page table word which identifies the memory page containing the data to be accessed in the page table established for said one peripheral channel,

e. assigning a data control word to said one peripheral channel, said data control word including a first field indicating which portion of the page table established for said one peripheral channel contains said page table word, and a second field indicating the location of said page table word within said portion,

f. utilizing said first and second fields of said data control word and said page table pointer to locate in said memory said page table word,

g. utilizing said page table word to access data in the page corresponding to said page table word, and

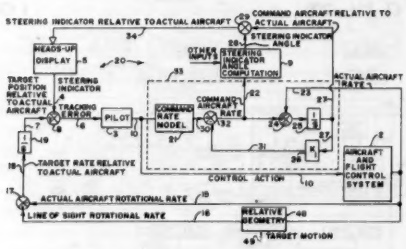
h. transferring said data between said page and the peripheral device connected to said one peripheral channel.

4,092,716

CONTROL MEANS AND METHOD FOR CONTROLLING AN OBJECT

Robert L. Berg, St. Louis, and William J. Murphy, Frontenac, both of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Jul. 11, 1975, Ser. No. 595,130
Int. Cl.² G06F *15/50*; G06G *7/80*
U.S. Cl. 364—424 **23 Claims**



1. A control device, comprising:

operator input means for initiating commands to control an object;

means responsive to said operator input means for operating on said object in accordance with commands imposed by said operator input means;

means for displaying a result of a command imposed by said operator means;

means for providing an idealized time-response model of said object, said idealized time-response model providing means being operatively connected to said operator input means and to said display means, said idealized time-response model means positioning said display means according to the effect of said operator commands on said idealized time-response model means, said idealized time-response model means acting directly on said display means to display the effect of said operator commands at least initially independently of the effect of said operator commands on said object so that said display means presents the reaction of said idealized model means to said operator commands; and

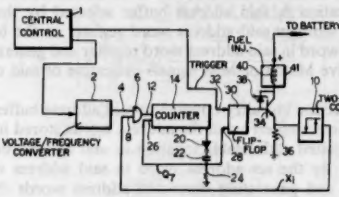
means for correlating the positions of said idealized time-response model means and said object, said correlating means acting on said display means to eliminate real time steady state errors between said idealized time response model means and said object on said display means.

4,092,717

METHOD AND APPARATUS FOR STABILIZING THE THROUGH FLOW OF ELECTROMAGNETIC INJECTORS

Vittorio Di Nunzio, Turin, Italy, assignor to FIAT Societa per Azioni, Turin, Italy

Filed Oct. 28, 1976, Ser. No. 736,684
Claims priority, application Italy, Nov. 12, 1975, 69788 A/75
Int. Cl.² F02B *3/00*
U.S. Cl. 364—431 **6 Claims**



1. In a fuel injection system of the type wherein an injector control pulse defines the time during which energizing current is supplied to the operating solenoid of an electromagnetic fuel injector from a vehicle battery, said injector opening when the level of said solenoid energizing current exceeds a first predetermined threshold value A and closing when said solenoid energizing current falls below a second predetermined threshold value B, thereby defining an injector open period of duration τ_{xi}, a device for stabilizing the open period of said injector so that said open period τ_{xi} is of a desired duration substantially independent of battery voltage, comprising:

first means producing a signal having a period proportional to the desired duration of the injection period,

a coincidence circuit having a first input connected to the output of said first means and a second input,

a two-threshold comparator circuit the output of which is connected to the second input of the coincidence circuit,

a counter having a first input connected to the output of the said coincidence circuit and a second input,

a differentiating network providing a reset signal at said second input,

a flip-flop circuit having an input constituted by the output of the differentiating network, and

a switching circuit, controlled by the output from said flip-flop circuit, for providing to said comparator a voltage signal proportional to the energizing current through said operating solenoid.

4,092,718

COMPUTERIZED DISPATCHING SYSTEM

Hans J. Wendt, Bechsteinstrasse 4, 215 Buxtehude, Germany

Continuation of Ser. No. 453,545, Mar. 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 307,554, Nov. 17, 1972, abandoned. This application Jul. 18, 1975, Ser. No. 597,154
Int. Cl.² B61L *27/00*; G06F *15/56*
U.S. Cl. 364—436 **10 Claims**

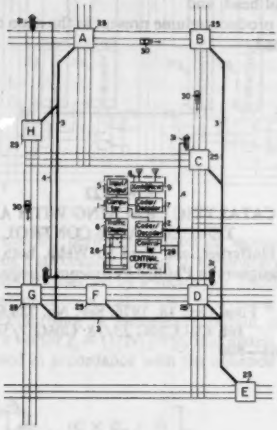
1. An automatic dispatching system for a fleet of independently driver-operated vehicles serving a predetermined area with a multiplicity of potential stops for said vehicles at fixed locations, comprising:

centralized computer means;

station equipment at each of said locations linked by a telecommunication channel with said computer means, said equipment including a destination selector operable by prospective passengers; and

information means aboard each vehicle in communication

with said computer means, said information means including a register for the entry of stop identifications representing the destinations of passengers boarding the vehicle and station-indicating means for giving routing instructions to the driver of the vehicle, said computer means including logical circuitry and decision stages of a general-purpose computer programmed to evaluate data from the destination selectors at all said locations and from the registers aboard all said vehicles for operating said station-indicating means to route each vehicle to stops requiring service, while skipping stops not entered in the register thereof unless the destination selector at such stop is operated to report a prospective passenger, by the steps of



(a) determining whether any passenger aboard a given vehicle has the next stop as a destination,

(b) determining whether passengers are waiting at said next stop with destinations along the route traveled by said given vehicle,

(c) determining, upon a positive determination in step (b), whether said next stop is being served by another vehicle traveling the same route and having available space for said waiting passengers,

(d) upon a negative determination in step (a), and either a negative determination in step (b) or a positive determination in step (c), instructing the driver of said given vehicle to bypass said next stop.

4,092,719

AUTOADAPTIVE WORKING CENTER FOR PROGRAMMABLE AUTOMATION

Mario Salmon, Ivrea (Turin), Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Aug. 26, 1976, Ser. No. 717,945

Claims priority, application Italy, Sep. 3, 1975, 69197 A/75

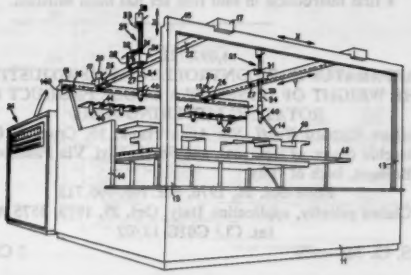
Int. Cl.[2] B23P *19/04*

U.S. Cl. 364—468 **4 Claims**

1. In an autoadaptive working center for programmable automation having at least one operating head for performing work on a workpiece, servomotor means for moving said operating head along a predetermined path in at least two coordinates, a central processing unit comprising a program unit for storing the working center program and a processing unit for executing the working center program, said program unit additionally storing position data for defining the path of said operating head and process data for defining the operations to be performed by said operating head at predetermined points along the path of said operating head, and a control unit responsive to the position and process data in said program unit for controlling the operation of said servomotor means, wherein the improvement comprises:

a plurality of transducers mounted on said operating head for sensing abnormal operating conditions at said operating head different than the operating conditions anticipated by the working center program and generating signals representative of these abnormal operating conditions; and

transmitting means connected to said plurality of transducers for transmitting the signals representative of abnormal



operating conditions to said central processing unit, wherein said processing unit further comprises addressing means connected to said transmitting means for generating addresses corresponding to the signals representative of abnormal operating conditions, said addressing means being connected to said program unit for addressing rescue subroutines stored in said program unit corresponding to the different abnormal operating conditions to enable said processing unit to execute a rescue operation on said operating head.

4,092,720

MULTI-TOOL MACHINE PROVIDED WITH A NUMERICAL CONTROL SYSTEM

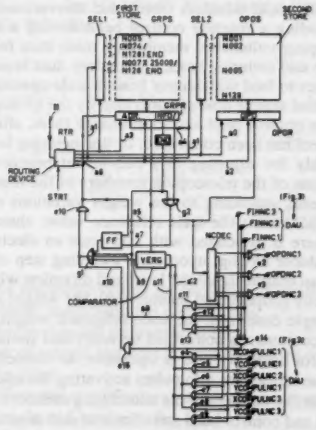
Robert Carey, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 6, 1976, Ser. No. 729,900

Claims priority, application Netherlands, Jun. 10, 1975, 7511705

Int. Cl.[2] G06F *11/00*

U.S. Cl. 364—474 **5 Claims**



1. A method of machining a workpiece by means of a multi-

tool machine provided with a numerical control system for individually controlling different tools of the machine, comprising the steps of:

providing machining instructions for controlling individual ones of said tools, said instructions being divided into groups, the instructions in one group being further divided into sets, the instructions in a first set relating to the control of different tools being executable simultaneously;

simultaneously executing the instructions in said first set; and

subsequently simultaneously executing a second set of instructions within said group after a condition imposed by a first instruction in said first set has been satisfied.

4,092,721

APPARATUS FOR CONTROLLING AND ADJUSTING THE WEIGHT OF DOSES OF A LOOSE PRODUCT IN A ROTATING METERING HEAD

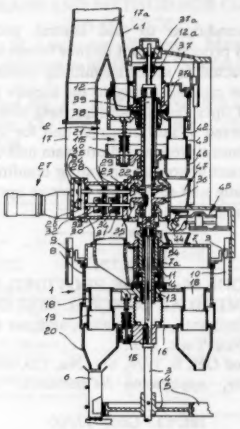
Herbert Richard Rueff, Via Anna Frank, 10, Croce di Casalecchio (Prov. of Bologna), and Sergio Vivi, Via Pasubio, 26, Bologna, both of Italy

Filed Oct. 26, 1976, Ser. No. 735,712

Claims priority, application Italy, Oct. 29, 1975, 3575 A/75

Int. Cl.² G01G *13/02*

U.S. Cl. 364—479 **2 Claims**



1. An apparatus for controlling and adjusting the weight of doses of a loose product in a rotating metering head having telescoping volumetric members distributed therearound, the apparatus including a rotating control head having a set of sample telescoping volumetric members, a main duct feeding said product to said metering head, a secondary duct branched off the main duct to feed said control head, a scale operative to receive individual sample doses as provided by the telescoping members of the control head and to discharge them, after the weighing thereof has been completed, to the metering head, a control assembly for adjusting in a concurrent proportional mode the volume of the telescoping members of the metering and control heads according to the weight variations of the weighed product versus the scale reference value, characterized in that there is associated with said scale an electromechanical transducer having, upon each weighing step of said sample doses, an output signal the level and direction whereof vary in a directly proportional manner with the weight deviation of the sample dose from the scale reference weight, than an electronic computer is connected between said transducer and said control assembly and is operative to convert said signals from the transducer into pulses activating the assembly such as to adjust the volumes of the telescoping members of the metering head and control head and eliminate said deviation in the doses supplied thereby and such that, in order for the adjustment of the metering head telescoping member volumes to be completed just before the introduction therein of the product of equal density weighed on the scale and determining said adjustment, the ratio n/N of the control head rpm n and metering head rpm N is substantially equal to:

$$\frac{V}{v} \times \frac{B}{b} \times \frac{m}{M+m}$$

where:

V is the volume of one metering head telescoping member;

B is the number of metering head telescoping members;

v is the volume of one control head telescoping member;

b is the number of control head telescoping members;

m is the product volume present in the secondary duct and control head; and

M is the product volume present in the main duct and metering head.

4,092,722

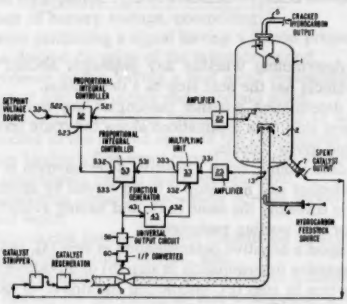
FLUID CATALYTIC CRACKING WITH AUTOMATIC TEMPERATURE CONTROL

James A. Hofferber, and Paul U. Webb, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 18, 1976, Ser. No. 733,666

Int. Cl.² C10G *13/18*; G06G *7/58*

U.S. Cl. 364—500 **10 Claims**



5. An apparatus for controlling the operation of a catalytic cracker comprising:

a. a first temperature sensing unit capable of sensing the temperature in the bed of a catalytic cracker and having a first output,

b. a second temperature sensing unit capable of sensing the temperature in the riser of a catalytic cracker, and having a second output,

c. a first controller having a first input, a first setpoint input and a first controller output, said first input being connected to said first output, said first setpoint input being connected to a setpoint source,

d. a second controller having a second input, a second setpoint input and a second controller output, said second input being connected to said second output, said second setpoint input being connected to said first controller output, and

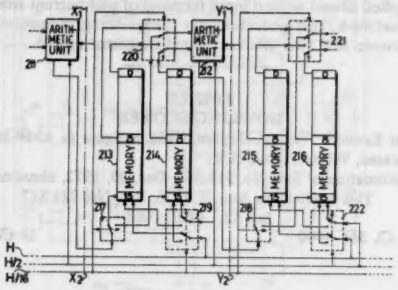
e. an adapting unit having an adapting input and adapting output, said adapting input being connected to said second controller output and said adapting output being capable of delivering a signal for manipulating a valve.

4,092,723

COMPUTER FOR COMPUTING A DISCRETE FOURIER TRANSFORM

Jean-Edgar Picquendar, and Boris Sokoloff, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Oct. 1, 1976, Ser. No. 728,505
Claims priority, application France, Oct. 2, 1975, 75 30235
Int. Cl.[2] G06F *15/34*
U.S. Cl. 364—726 **6 Claims**



1. An apparatus for performing upon an incoming digital signal comprising a succession of $N = 2^n$ elementary incoming digital signals and represented by a vector f_j, a discrete Fourier transform represented by a matrix [W], delivering an output digital signal comprising N elementary output signals and represented by a vector $g_j = (1/N)\,[W]f_j$, said matrix being able to be decomposed in accordance with the equation

$$[W] = Q\left[\prod_{m=1}^{n} (C \times E_m \times P)\right],$$

said apparatus comprising a succession of n modules connected in series, each of said modules corresponding to the calculation of one term $C \times E_m \times P$, the first of said modules receiving said incoming digital signal, the last of said modules delivering a non-standardized succession of N output digital signals represented by a vector

$$\left[\prod_{m=1}^{n} (C \times E_m \times P)\right] \vec{f}_j, \text{ and}$$

each of said modules comprising:

memory means for receiving from the preceding module N intermediate digital signals in succession in accordance with a first order, and further delivering pairs of said intermediate digital signals in succession in accordance with a second order defined by the matrix P; and

calculating means connected to said memory means for receiving said pairs of intermediate digital signals, performing upon said pairs of intermediate digital signals the calculations corresponding to the matrix product $C \times E_m$, and delivering to the next module successively N next intermediate digital signals.

4,092,724

POLAR CONVERTER

Hugo Vifian, Santa Rosa, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

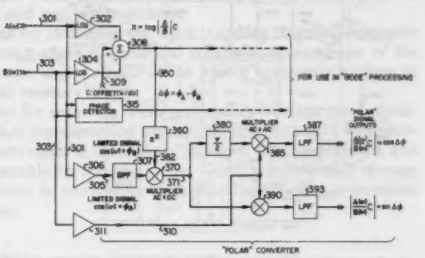
Filed Nov. 5, 1976, Ser. No. 740,689
Int. Cl.[2] G06G *7/16, 7/22, 7/24*
U.S. Cl. 364—817 **2 Claims**

1. Apparatus for providing a polar display of the ratio of first and second electrical signals, said apparatus comprising:

logarithmic converter means for providing first and second logarithmic signals having a logarithmic relationship to said first and second electrical signals;

summing means coupled to said logarithmic converter means for providing a third electrical signal representing the difference between said first and second logarithmic signals;

first circuit means coupled to said summing means for providing a linear output signal in response to said third output signal;



limiting means for providing first and second limited signals representing the phase information of said first and second electrical signals, respectively;

first multiplier means coupled to said first circuit means and said limiting means for mixing the linear output signal with the first limited signal and for producing a first AC signal in response thereto; and

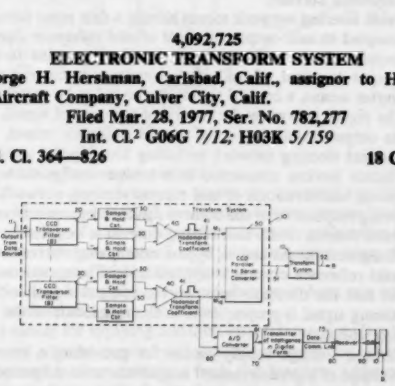
output means coupled to said first multiplier means and said limiting means for providing polar display signals in response to said first AC signal and said second limited signal.

4,092,725

ELECTRONIC TRANSFORM SYSTEM

George H. Hershman, Carlsbad, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 28, 1977, Ser. No. 782,277
Int. Cl.[2] G06G *7/12;* H03K *5/159*
U.S. Cl. 364—826 **18 Claims**



1. An electronic system for providing discrete mathematical transforms, comprising the combination:

a charge-coupled transversal filter;

a pair of sample and hold circuits connected to the output of the filter;

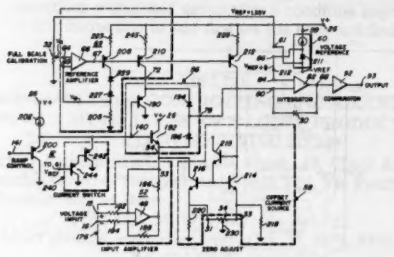
a differential amplifier connected to the output of the pair of sample and hold circuits; and

an analog-to-digital converter connected to the output of the differential amplifier.

4,092,726
ANALOG-TO-DIGITAL CONVERTER SYSTEM

John A. Schoeff, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 370,519, Jun. 15, 1973, abandoned. This application Apr. 23, 1975, Ser. No. 570,908
Int. Cl.[2] G06G 7/18
U.S. Cl. 364—829 6 Claims



1. An analog subsystem of an electronic system which converts the magnitude of an analog voltage into a corresponding digital signal, the electronic system having a digital subsystem for providing a control signal and requiring a timing signal after the control signal, the duration between the control signal and the timing signal being required to be proportional to the magnitude of the analog voltage, the analog subsystem for providing the timing signal including in combination:

integrator means;

comparator means for providing the timing signal, said comparator means being adapted to be coupled between said integrator means and the digital subsystem;

active reference current supply means for providing a reference current at an output terminal which has a constant magnitude and a predetermined direction;

active analog voltage-to-current converter means for providing an analog current at an output terminal thereof which has a magnitude that is proportional to the magnitude of the analog voltage, said analog current having a direction opposite to said predetermined direction of said reference current;

current steering network means having a first input terminal coupled to said output terminal of said reference current supply means, a second input terminal coupled to said output terminal of said analog voltage-to-current converter means, a control terminal adapted to be coupled to the digital subsystem for receiving the control signal, and an output terminal coupled to said integrator means, said current steering network including four bipolar semiconductor devices connected in a bridge configuration between said terminals of said current steering network and being responsive to the control signal to bypass said reference current while said analog current is coupled to said integrator means and to bypass said analog current while said reference current is applied to said integrator means so that the duration between the control signal and the timing signal is proportional to the magnitude of the analog voltage;

reference voltage supply means for providing a constant voltage of a predetermined magnitude at an output terminal thereof; and

ramp offset current means coupled between said output terminal of said reference voltage supply means and said second input terminal of said current steering network, said ramp offset current means being responsive to said constant voltage at said output terminal of said reference voltage supply means to provide a constant current at said second terminal of said current steering network which has a magnitude of a predetermined relationship to said magnitude of said reference current for causing the output voltage of said integrator means to change in a predetermined manner even though no analog voltage is applied to said analog voltage-to-converter means, said ramp offset current means further having bias current supply means coupled to said reference voltage supply, current control circuit means having two interconnected transistor means, one of said transistor means being coupled to said second input terminal of said current steering network means and the other of said transistor means being coupled to said bias current supply means, and potentiometer means for adjusting the magnitude of said ramp offset current applied to said second input terminal of said current steering network, said potentiometer means being connected between said two interconnected transistor means.

4,092,727
BOWLING SCORER

Roger Kenneth Warner, Dayton, Ohio, assignor to AMF Incorporated, White Plains, N.Y.

Continuation of Ser. No. 319,353, Dec. 29, 1972, abandoned. This application Aug. 3, 1976, Ser. No. 711,217
Int. Cl.[2] A63D 5/00
U.S. Cl. 364—900 18 Claims

1. Means for calculating and displaying bowling scores, comprising:

input means for recording ball by ball pinfall, strikes and spares for at least one bowler in the course of a bowling game;

computing means selectively energized to calculate a running score for a said bowler through the last bowling frame completed in said game;

actuating means selectively energizing said computing means; and

display means controlled by said computing means for displaying the individual results of each ball rolled by a said bowler in the course of said game through the last completed frame, updated substantially concurrently with each selective energization of said computing means;

said computing means including means constraining said computing means to scan said input means and calculate and constrain said display means to display anew each and every factor of said bowlers score from the first ball rolled in said game for each and every selective energization of said computing meamns through the last frame completed by said bowler.

4,092,728
PARALLEL ACCESS MEMORY SYSTEM

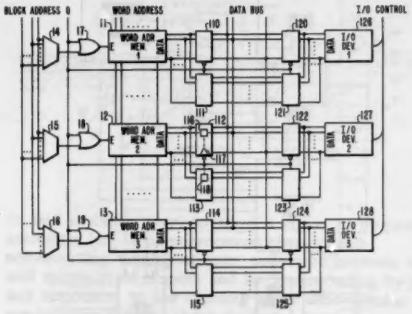
Philip Keene Baltzer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 29, 1976, Ser. No. 746,430
Int. Cl.[2] G06F 3/00, 13/00
U.S. Cl. 364—900 7 Claims

3. In a system including data storage means comprising a plurality of memory means, each responsive to common word address signals and separate block address signals and having

access port means for transferring data over a common data bus, said system also including a plurality of utilization devices having data port means coupled to said data bus whereby each specific memory means is associated with a specific utilization device, the improvement comprising:

switching means having two states coupled to said access port means of said memory means and to said data port means of the associated peripheral device for selectively



coupling said port means to said common data bus in one state and coupling said access port means and data port means together and disconnecting both port means from said data bus in a second state;

means responsive to a control signal for changing said switching means from one state to another; and

means responsive to said control signal for activating said block address of said memory means.

4,092,729

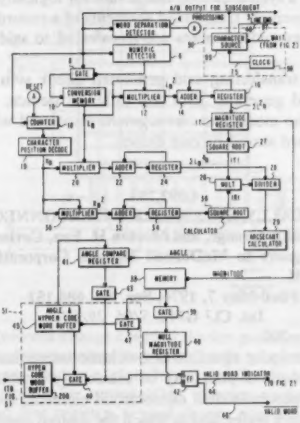
APPARATUS FOR AUTOMATICALLY FORMING HYPHENATED WORDS

Walter Steven Rosenbaum, Bethesda, Md., and Howard Carl Tanner, Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1976, Ser. No. 754,938

Int. Cl.² G06F *5/00*

U.S. Cl. 364—900 **9 Claims**



5. In combination apparatus for verifying the spelling of an input word and automatically hyphenating the word comprising:

a source of input characters;

storage means for receiving said input characters;

means for detecting the end of a word;

conversion means connected said storage means for converting said word into a vector having a magnitude and an absolutely unique angle;

memory means containing vector representations of a dictionary of words including representations of the hyphenation points for the words;

addressing means for accessing said memory means at the address defined by the vector magnitude of the input word;

comparator means for comparing the vector angle of the input word to vector angles stored in said memory means at said magnitude address;

means for indicating the word is spelled correctly when the vector angle of the word compares equal to one of the vector angles stored at the vector magnitude address in said memory means;

means for receiving from said memory means the hyphenation representation associated with the angle that compares equal to the angle of the word to be hyphenated, and operable to hyphenate the word stored in said storage means in accordance with said hyphenation representation.

4,092,730

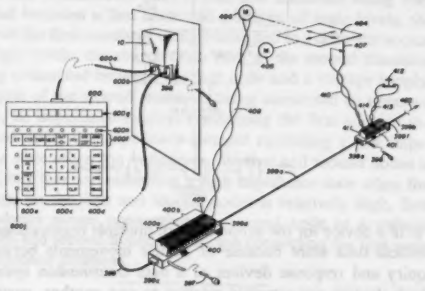
DATA PROCESSOR WITH READ-ONLY-MEMORY PROCESSOR AND PARTIAL SOLUTION PUSH-DOWN STACK

Bobby G. Burkett, Richardson, and Raymond W. Henry, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 643,970, Dec. 24, 1975, Pat. No. 4,030,080, which is a division of Ser. No. 431,538, Jan. 7, 1974, Pat. No. 3,953,834. This application Mar. 28, 1977, Ser. No. 781,605

Int. Cl.² G06F *13/00, 9/00, 15/20*

U.S. Cl. 364—900 **7 Claims**



1. A data processor comprising:

(a) boolean logic processor means comprised of a read-only-memory means, said read-only-memory means having a plurality of address inputs for selectively addressing memory locations thereof, said locations containing stored solutions to boolean equations;

(b) means for applying boolean data to at least one address input of said memory means;

(c) means for applying multi-bit instructions to a plurality of said address inputs, said processor means for providing stored boolean solutions from the locations addressed in accordance with the boolean data and instructions provided at said address inputs;

(d) a partial solution memory means in the form of a reversible serial storage means, said reversible storage means having an input coupled to said processor means for receiving and storing single-bit partial solutions to boolean equations provided by said processor means in a predetermined order and having an output coupled to an address input of said processor means for transferring partial solutions stored therein to said processor means in the reverse

order from said predetermined order, said processor means for providing stored boolean solutions from the locations addressed in accordance with the partial solutions and instructions provided at said address inputs; and

(e) means for controlling the sequence of operations of said data processor; wherein

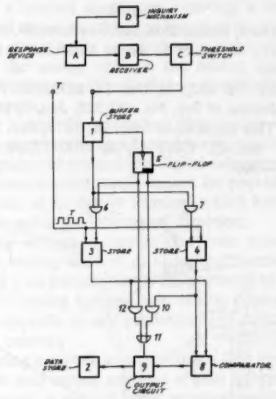
(f) boolean data is processed by said processor means into single-bit partial boolean solutions which are stored in said reversible storage means and wherein said partial boolean solutions are combined into single-bit boolean solutions by said processor means taking said partial solutions in reverse order.

4,092,731

DEVICE FOR SUPPRESSING MULTIPLE REGISTRATIONS IN A DATA STORE

Lothar Bauer, Hondelage, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 4, 1977, Ser. No. 756,740
Claims priority, application Germany, Jan. 12, 1976, 2600869
Int. Cl.² G06F 7/02
U.S. Cl. 364—900 **2 Claims**



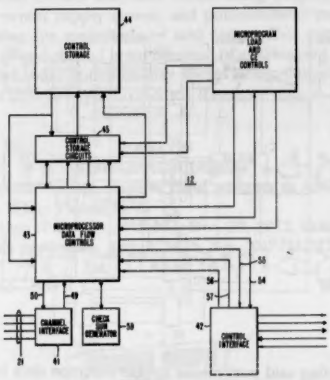
1. In a device for the suppression of multiple registrations of identical data store because of shuttle movements between inquiry and response devices of a data transmission system, which devices are movable relative to one another, particularly in a system for automatic number-reporting of freight cars and for point-to-point train control in railroading, the combination of an inquiry device having a buffer store in which data transmitted to the inquiry device from a response device are initially stored upon reception of such data, a pair of AND-members, a bistable flipflop having its trigger input opertively connected to said buffer store and its respective outputs connected to first inputs of said two AND-members, the second inputs of which are connected to the output of the buffer store, a pair of stores having their inputs connected to respective outputs of said AND-members, and a further pair of AND-members, the outputs of said stores being connected to respective first inputs of said further AND-members, the second inputs thereof being connected to respective outputs of said flipflop, an output circuit, a mixing member connecting the outputs of said further AND-members to said output circuit, and a comparator, the output signal of which controls said output circuit, said comparator being coupled to the outputs of said pair of stores and switching the output circuit in the presence of differing data in the two stores.

4,092,732

SYSTEM FOR RECOVERING DATA STORED IN FAILED MEMORY UNIT

Norman Ken Ouchi, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 31, 1977, Ser. No. 801,961
Int. Cl.² G06F 11/02, 13/00
U.S. Cl. 364—900 **11 Claims**



6. In a data processing system having a main memory for storing system records being processed, a plurality of failure independent storage drives for storing system records before and after processing and means for controlling the selective transfers of a predetermined system record between said main memory and said storage device, the improvement comprising: an arrangement for storing said system records and an associated check sum to permit the recording of each system record stored on said storage devices when one of said devices becomes inoperable, said arrangement comprising:

means for dividing each system record into a plurality of equal segment said plurality being at least one less than the number of said storage devices;

means for transferring each of said segments of a system record between said main memory and a different one of said storage drives;

a check sum generator connected to said transfer means to generate a system record check sum for logically combining successively transferred segments of a record simultaneously as said segments are transferred to said devices; and

means for transferring said generated check sum segment from said generator to a still different device, whereby there is no more than one segment associated with a system record stored on one device.

4,092,733

ELECTRICALLY ALTERABLE INTERCONNECTION

Leland I. Coontz, Orange, and Morton H. Fox, Covina, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed May 7, 1976, Ser. No. 684,152
Int. Cl.² G11C 5/06, 29/00
U.S. Cl. 365—200 **12 Claims**

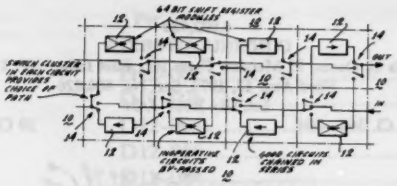
1. An electrically alterable non-volatile interconnection by which a conductive path may be selectively established and opened between individual microcircuit elements formed in a grid pattern on a wafer, and in which the desired conductive or nonconductive state is set during an initial setting phase of a cycle of operation and maintained indefinitely thereafter during an operating phase until altered during a subsequent erase phase, comprising:

an electrically alterable non-volatile memory into which is

read for storage, during the initial setting phase, information defining the desired state;

a bistable device whose state during the operating phase is determined by the information stored in said electrically alterable non-volatile memory, for generating an enable signal during the operating phase;

an electrical by-pass adapted to selectively electrically by-pass each said individual microcircuit element responsive



to said enabling signal to allow a signal to by-pass its associated individual microcircuit element; and

a non-inverting, amplifying gate, connected between each said microcircuit element and its corresponding by-pass and responsive to the enabling signal to determine the conductance between those elements;

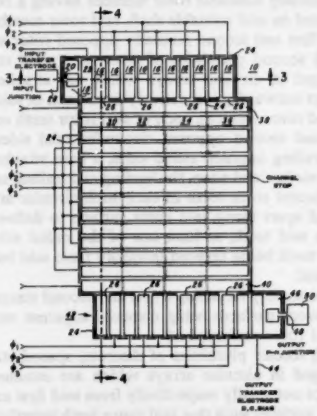
said electrically alterable non-volatile memory, said bistable device, said by-pass and said gate formed on the same wafer as the microcircuit elements are formed.

4,092,734

ANALOGUE MEMORY

Dean R. Collins, Dallas, and Bill R. Norvell, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 207,905, Dec. 14, 1971, abandoned.
This application Jun. 6, 1977, Ser. No. 803,720
Int. Cl.² G11C *11/40*
U.S. Cl. 365—238 **4 Claims**



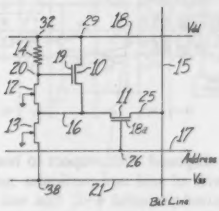
1. An improved charge coupled device memory on a semiconductor substrate comprising first charge coupled serial shift register means having a plurality of serially disposed multi-phase electrodes for propagating charge packets serially through said first register; second charge coupled serial shift register means having a plurality of serially disposed multi-phase electrodes for propagating charge packets serially through said second register; a plurality of charge coupled parallel shift registers having parallel inputs aligned with and spaced apart from electrodes of a selected phase of said first register, a plurality of multi-phase electrodes for propagating charge packets in parallel through said parallel registers, and parallel outputs aligned with and spaced apart from electrodes of a selected phase of said second register, the improvement comprising first transfer electrode means in said space between said first serial register and said parallel register inputs for transferring charge packets in parallel therebetween, and second transfer electrode means in said space between said parallel register outputs and said serial register for tranferring charge packets in parallel therebetween, wherein said first and second transfer electrodes are electrically isolated and independently operable from said phase electrodes of said first, second, and parallel registers.

4,092,735

STATIC MEMORY CELL USING FIELD IMPLANTED RESISTANCE

David J. McElroy, Houston, Tex., assignor to Texas Instruments Incorporated

Filed Dec. 27, 1976, Ser. No. 754,208
Int. Cl.² G11C *11/40*
U.S. Cl. 365—183 **17 Claims**



1. A semiconductor integrated circuit comprising first and second MOS transistors each having a source-drain path and a gate, the source-drain path of the first transistor being connected between a first node and a source of logic levels, the gate of the first transistor being connected to a different source of logic levels, the source-drain path of the second transistor being connected between the first node and a voltage supply, the gate of the second transistor being connected to a second node, an impedance element connecting the first node to the second node, the impedance element exhibiting a low impedance state when the voltage on the first and second nodes is relatively low and exhibiting a high impedance state when the voltage on the first and second nodes is relatively high, first impedance means connecting the second node to a voltage supply, and second impedance means connecting the first node to reference potential.

4,092,736

THREE ELECTRODE DYNAMIC SEMICONDUCTOR MEMORY CELL WITH COINCIDENT SELECTION

Roger Thomas Baker, Box 240, Mt. Tabor, N.J. 07878

Filed Jul. 6, 1976, Ser. No. 702,841
Int. Cl.² G11C *7/00, 11/34*
U.S. Cl. 365—189 **2 Claims**

1. In the class of semiconductor random access memory arrays wherein a plurality of memory cells are disposed in rows and columns, and each of said memory cells is provided with no more than three electrodes, and

wherein in each of said memory cells a first electrode in proximity to and insulated from a semiconducting substrate is utilized to form in said semiconducting substrate a first potential well for mobile charge carriers of one polarity, and

wherein in each of said memory cells binary datum is represented by the density of mobile charge carriers of said polarity which are stored in the said first potential well of the said memory cell,

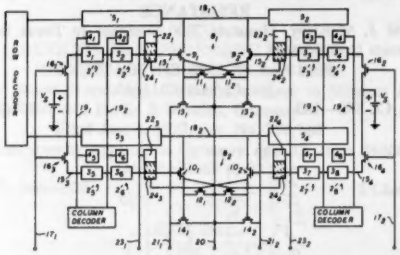
a method of destructively recalling the value of the binary datum stored in said memory cells, comprising the steps of

selecting one of said rows of memory cells,

utilizing a second electrode in proximity to and insulated from said semiconducting substrate to form in said semiconducting substrate a second potential well for said polarity of mobile charge carriers, said second potential well being in close proximity to and distinct from each of the said first potential wells of the said memory cells in the said selected row,

selecting from said selected row of memory cells, one particular memory cell,

utilizing a third electrode in proximity to and insulated from said semiconducting substrate to form in said semiconducting substrate a third potential well for said polarity of mobile charge carriers, said third potential



well being disposed with respect to both the said first potential well of said one particular memory cell and the said second potential well, that said third potential well forms a channel for mobile charge carriers of said polarity, said channel connecting said first potential well of said one particular memory cell and said second potential well,

said second and said third potential wells being such that through said channel some fraction of any mobile charge carriers of said polarity stored in the said first potential well of said one particular memory cell, transfer to the said second potential well, and

detecting on the said first electrode of the said one particular memory cell, any potential change resulting from said transfer of charge carriers.

4,092,737

METHOD FOR PREPARING FIBERS FOR MIXING INTO A SPRAYED CONCRETE MASS AND A DEVICE FOR PERFORMING THE METHOD

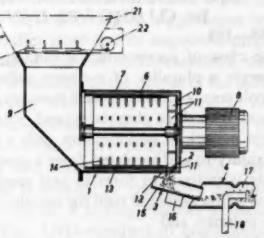
Bertil Sandell, Hovås, Sweden, 43080

Filed Aug. 2, 1976, Ser. No. 710,702

Claims priority, application Sweden, Aug. 11, 1975, 7508720

Int. Cl.² B28C 5/20, 5/40, 5/46

U.S. Cl. 366—3 **18 Claims**



1. A method for preparing hard metallic fibers, particularly steel fibers formed into bundles or closely-packed lumps, for mixing into a sprayed concrete mass, comprising the steps of:

separating the fibers by tumbling;

unobstructedly dropping the fibers upon an inclined plane to align the fibers in one plane;

subjecting the fibers to an air stream to cause the longitudinal axes of said fibers to become essentially parallel; and,

mixing the fibers with a concrete mass.

4,092,738

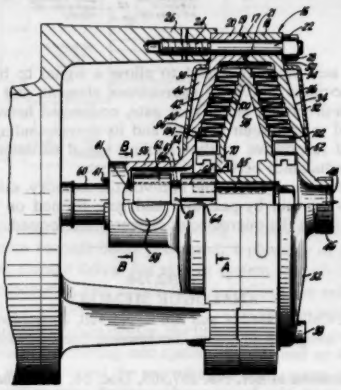
CONTINUOUS MIXER

Lewis G. Doom, 95 Meadow Farm Rd., East Islip, N.Y. 11730

Filed Aug. 12, 1975, Ser. No. 604,026

Int. Cl.² B01F 7/04

U.S. Cl. 366—304 **20 Claims**



1. Mixing apparatus including:

a rotatable shaft;

a continuously rotatable rotor member having a central axis mounted on said rotatable shaft, said rotor member including a first and second mutually opposed rotor surfaces;

first and second pluralities of discrete, spaced rotor teeth arranged in circular arrays which are attached to and project outwardly respectively from each of said first and second rotor surfaces, each of said rotor teeth comprising first and second opposed circumferential sides, leading and trailing opposed radial sides, a base attached to said rotor surface and a top, the leading and trailing radial sides of adjacent rotor teeth in each such circular array being spaced apart along said rotor surface to define gaps between said teeth, at least one of the radial sides of said rotor teeth being tapered inwardly from said base to said top; and

a stator assembly including a first and second stator surfaces, said stator surfaces being disposed adjacent respectively to said rotor surfaces and

first and second pluralities of discrete, spaced stator teeth arranged in circular arrays which are attached to and project outwardly respectively from said first and second stator surfaces such that said stator teeth interdigitate with said rotor teeth, each of said stator teeth including a first and a second opposed circumferential sides, a leading and trailing opposed radial sides, a base attached to said stator surface and a top, the leading and trailing radial sides of adjacent stator teeth in each such circular array being spaced apart along said stator surface to define gaps between said teeth, at least one of said radial sides of said stator teeth being tapered inwardly from said base to said top.

DESIGN PATENTS

GRANTED MAY 30, 1978

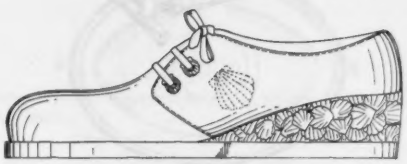
ERRATA

For CLASS	See PATENT NO.
D12-005	248,029
D12-005	248,030
D12-005	248,031
D12-066	248,032
D12-084	248,033
D12-127	248,034
D12-127	248,035
D12-127	248,036
D12-155	248,037
D12-182	248,038

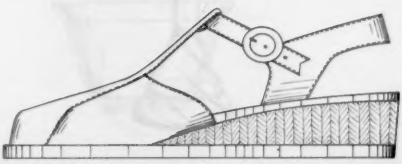
DESIGNS

MAY 30, 1978

247,996
SHOE
Victor F. Anderson, Wenonah, N.J., assignor to Shell Oil Company, Houston, Tex.
Filed Apr. 12, 1976, Ser. No. 676,168
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—287



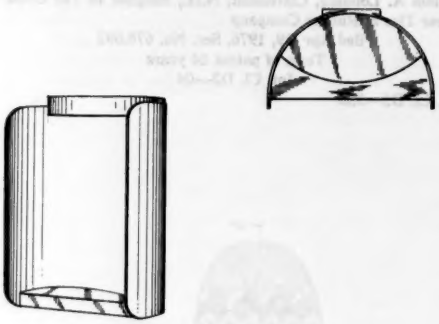
247,997
SHOE
Victor F. Anderson, Wenonah, N.J., assignor to Shell Oil Company, Houston, Tex.
Filed Apr. 12, 1976, Ser. No. 676,163
Term of patent 3½ years
Int. Cl. D2—*04*
U.S. Cl. D2—298



247,998
COMBINED SOLE AND HEEL FOR FOOTWEAR
William A. Lobosco, Claremont, N.H., assignor to The Goodyear Tire & Rubber Company
Filed Apr. 19, 1976, Ser. No. 678,092
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320

247,999
SOAP STAND
Blanche E. Whatley, 228 E. 15th No. 202, North Vancouver, British Columbia, Canada (V7L 2R3)
Filed Feb. 7, 1977, Ser. No. 766,032
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—89

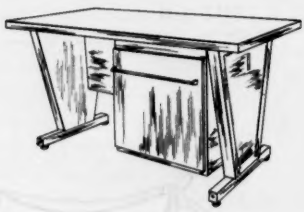
248,000
TELEPHONE KIOSK
Lawrence J. Torn, Woodbury, and Peter Breslin, College Point, both of N.Y., assignors to Redyref-Pressed & Welded, Inc., Long Island City, N.Y.
Filed Jan. 6, 1977, Ser. No. 757,131
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D6—20



248,001
TOILET TISSUE DISPENSER
Tony Santaella, 25934 Matfield Dr., Torrance, Calif. 90505
Filed Jun. 23, 1977, Ser. No. 809,327
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—97

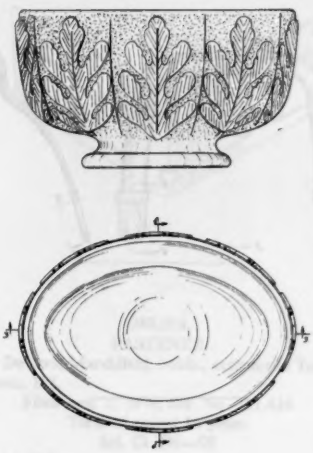
248,002
SUSPENDIBLE SUPPORT FOR POTTED PLANTS OR THE LIKE
Dennis E. Staub, and Fred W. Boldt, both of P.O. Box 600, Minneola, Fla. 32755
Filed Apr. 28, 1976, Ser. No. 681,259
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—113

248,003
ELECTRONIC MODULAR DESK
Kenneth F. Gazarek, Warrenville, Ill., assignor to Equipto Electronics Corporation
Division of Ser. No. 644,052, Dec. 24, 1975. This application Nov. 23, 1976, Ser. No. 744,314
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—161



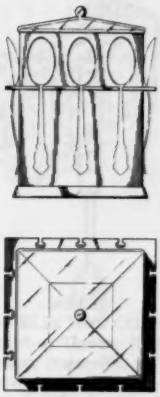
248,004
BEVERAGE TUMBLER
Alan H. Simpson, 9401 Roberts Dr., NW., Apt. 35B, Atlanta, Ga. 30338
Filed Nov. 24, 1976, Ser. No. 744,686
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—13

248,005
FOOTED OVAL BOWL
Arthur L. Harshman, Dunkirk, Ind., and James I. Messmer, Detroit, Mich., assignors to Florists' Transworld Delivery Association
Filed May 17, 1976, Ser. No. 687,187
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—22

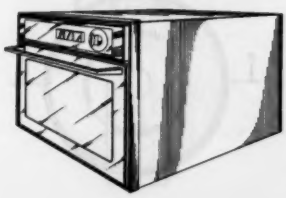


248,006
BOWL
Hubert E. Christian, Phoenix, Ariz., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Aug. 30, 1976, Ser. No. 718,924
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—23

248,007
COMBINED SPOON AND CANDLE HOLDER
Josephine I. Mackey, 316 S. Park St., Seymour, Ind. 47274
Filed Jan. 21, 1976, Ser. No. 650,896
Term of patent 14 years
Int. Cl. D7—*06*; D26—*01*
U.S. Cl. D7—74



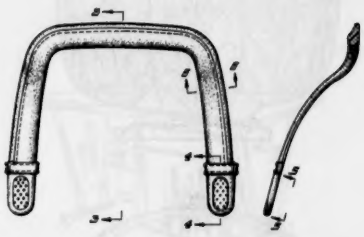
248,008
MICROWAVE OVEN
Chester J. Wojtowicz, Prospect Heights, and Melvin H. Boldt, Glenview, both of Ill., assignors to Amana Refrigeration, Inc., Amana, Iowa
Filed Jan. 7, 1976, Ser. No. 647,067
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—128



248,009
FEEDING SPOON
Thomas G. Cannon, Ft. Collins, Colo., and Spencer L. Mackay, Glendale, Calif., assignors to Teledyne Industries, Inc., Ft. Collins, Colo.
Filed Dec. 13, 1976, Ser. No. 749,747
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—141

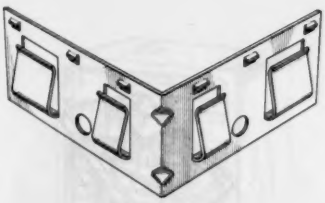
248,010
TUBE REPLACEMENT DEVICE
Eugene T. McKinnon, 16536 Chattanooga Place, Pacific Palisades, Calif. 90272, and Alvin S. Drutz, 11613 Clover, Los Angeles, Calif. 90066
Filed Aug. 30, 1976, Ser. No. 718,929
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—14

248,011
LUGGAGE HANDLE
Bela G. Szabo, Carnegie, Pa., assignor to Bruce Plastics, Inc., Pittsburgh, Pa.
Filed Jun. 18, 1976, Ser. No. 697,521
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—306



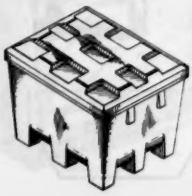
248,012
BOAT MOORING HOOK
Robert Rensen, 3111 NE. 51 St., #102, Fort Lauderdale, Fla. 33308
Filed Sept. 3, 1976, Ser. No. 720,197
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—372

248,013
CORNER CLIP FOR CONNECTING CEILING FRAME MEMBERS
Murray M. Win, Los Angeles, Calif., assignor to Malcolite Corporation, Monterey Park, Calif.
Filed Jun. 14, 1976, Ser. No. 695,657
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—373

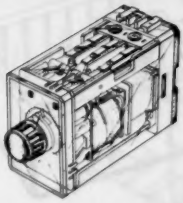


248,014
FASTENER
Charles J. DeCaro, Marshfield, Mass., assignor to Textron Inc., Providence, R.I.
Filed Aug. 3, 1976, Ser. No. 711,414
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—387

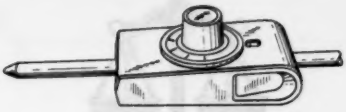
248,015
COMBINED SHIPPING AND STORAGE CONTAINER
Rush B. Smith, Philadelphia, Pa., assignor to Pennsylvania Pacific Corporation, Warminster, Pa.
Filed Dec. 12, 1975, Ser. No. 640,003
Term of patent 14 years
Int. Cl. D9—*05*
U.S. Cl. D9—237



248,016
MOTOR TIMER
Teizo Fujita, and Toshiro Ohashi, both of Osaka, Japan, assignors to Izumi Denki Company Limited, Osaka, Japan
Filed Aug. 2, 1976, Ser. No. 711,561
Claims priority, application Japan, Apr. 5, 1976, 51-12575; Apr. 5, 1976, 51-12576
Term of patent 14 years
Int. Cl. D10—*03*
U.S. Cl. D10—40

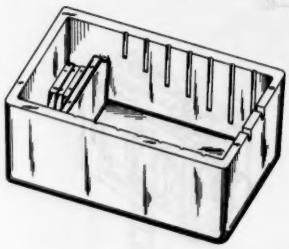


248,017
THERMOSTATIC ELECTRIC CONNECTOR PLUG
Melvin H. Boldt, Glenview; Thurber H. Morrison, Evanston, and Robert W. Becker, Naperville, all of Ill., assignors to National Presto Industries, Inc., Eau Claire, Wis.
Filed Nov. 5, 1976, Ser. No. 739,181
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—50



248,018
SURVEYING INSTRUMENT
Akio Kubo, 655 Yamanouchi, Kamakura-City, Kanagawa, Japan
Continuation-in-part of Ser. No. 470,144, May 15, 1974, abandoned. This application Jul. 15, 1976, Ser. No. 705,392
Claims priority, application Japan, Dec. 13, 1973, 48-46777; Dec. 13, 1973, 48-46778
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—66

248,019
MEASURING CONTAINER
P. Reilly Scheid, Glenview, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Aug. 9, 1976, Ser. No. 712,639
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—96



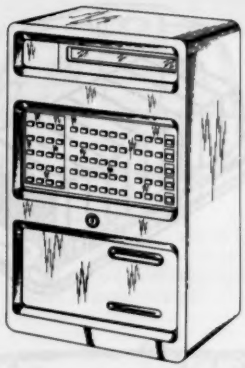
248,020
PENDANT OR SIMILAR ARTICLE
Elda Krecic, New York, N.Y., assignor to Monet Jewelers, Inc., New York, N.Y.
Filed Apr. 19, 1976, Ser. No. 678,344
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—81

248,021
BUTTERFLY PLAQUE
Donald R. Ditto, Dallas, Tex.
Filed May 13, 1976, Ser. No. 687,086
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—137

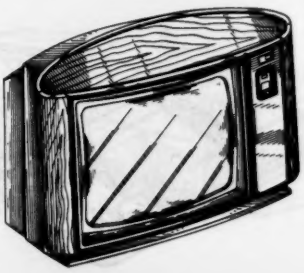
248,022
MULTIPLE PLANT CONTAINER
Antero Makilaakso, Hameenlinna, Finland, assignor to Huhtamiki Oy, Hameenlinna, Finland
Filed Dec. 20, 1976, Ser. No. 752,120
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—155

248,023
AUDIO SPEAKER CABINET
Ferdinand R. Minozzi; Stephen A. Minozzi, both of Yonkers, and Robert Pelepako, Dobbs Ferry, all of N.Y., assignors to M.B.O. Music Enterprises, Inc., Dobbs Ferry, N.Y.
Filed Jan. 14, 1977, Ser. No. 759,418
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—33

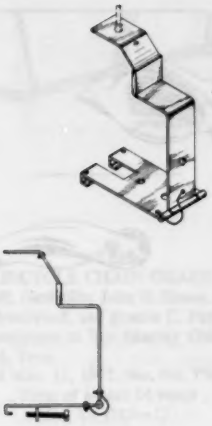
248,024
DATA COMMUNICATION TERMINAL
Robert Paul Tennant, and Ernest Wittner, both of Endicott, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Sep. 13, 1976, Ser. No. 722,842
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—42



248,025
TELEVISION RECEIVER
Melvin H. Boldt, Glenview; Richard K. Althans, Long Grove, and David P. Chuboff, North Barrington, all of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.
Filed Aug. 5, 1976, Ser. No. 712,109
Term of patent 7 years
Int. Cl. D14—*03*
U.S. Cl. D14—80



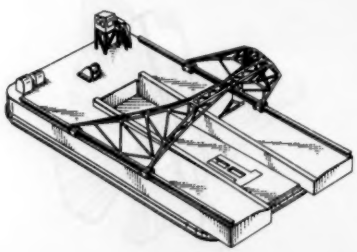
248,026
ANTENNA BRACKET
John J. Gostomski, 13826 Pierce, Omaha, Nebr. 68144
Filed Dec. 30, 1976, Ser. No. 755,527
Term of patent 14 years
Int. Cl. D14—*03, 99*
U.S. Cl. D14—91



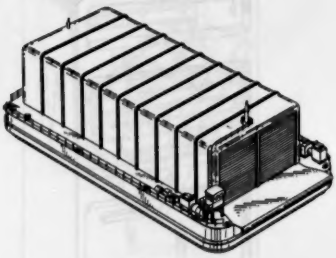
248,027
VACUUM CLEANER FOR LIQUID
Fernand Lachance, 330, 53è Rue, Ville Saint-Georges, Quebec, Canada
Filed Jan. 31, 1977, Ser. No. 764,281
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—53

248,028
WRITING INSTRUMENT
Fred Huffman, P.O. Box 893 Volcic Ct. Space "P", Rock Springs, Wyo. 82901
Filed May 4, 1976, Ser. No. 683,201
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—42

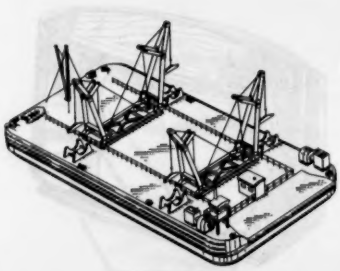
248,029
FLUID CUSHION SUPPORTED VEHICLE
Susan Stuart Hart, Romsey, and Paul Dominic Davis, Southampton, both of England, assignors to Mackley-Ace Limited, Southampton, England
Filed Jun. 21, 1976, Ser. No. 697,727
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—5



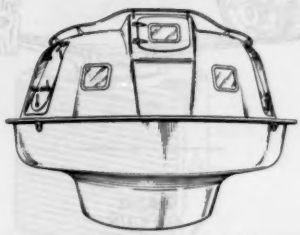
248,030
FLUID CUSHION SUPPORTED VEHICLE
Susan Stuart Hart, Romsey, and Paul Dominic Davis, Southampton, both of England, assignors to Mackley-Ace Limited, Southampton, England
Filed Jun. 21, 1976, Ser. No. 697,728
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—5

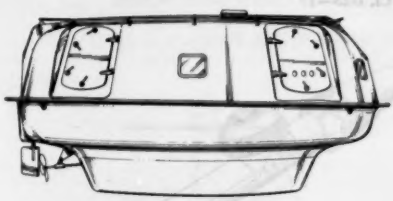


248,031
FLUID CUSHION SUPPORTED VEHICLE
Susan Stuart Hart, Romsey, and Paul Dominic Davis, Southampton, both of England, assignors to Mackley-Ace Limited, Southampton, England
Filed Jun. 21, 1976, Ser. No. 697,729
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—5

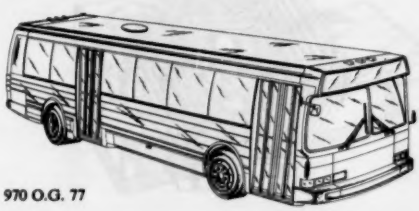


248,032
SURVIVAL CAPSULE
Eric Ralph Hooper, and Augustine Jose Pagan, both of El Cajon, Calif., assignors to Whittaker Corporation, Los Angeles, Calif.
Filed Jun. 11, 1976, Ser. No. 695,496
Term of patent 14 years
Int. Cl. D12—*14;* D29—*02*
U.S. Cl. D12—66



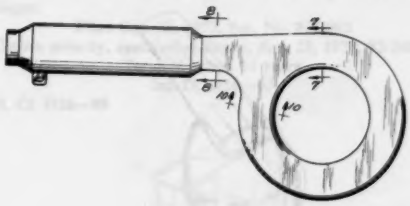


248,033
BUS
Norman J. James, Bonita, and Larry G. Hickey, Costa Mesa, both of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.
Filed Jan. 10, 1977, Ser. No. 757,900
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—84



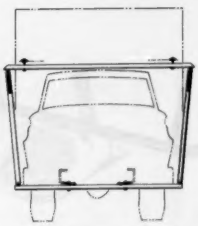
248,034
BICYCLE CHAIN GUARD
Richard D. Williams, Brentwood, and Dennis C. Patterson, Nashville, both of Tenn., assignors to The Murray Ohio Manufacturing Co., Brentwood, Tenn.
Filed Feb. 25, 1977, Ser. No. 772,235
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—127

248,035
BICYCLE CHAIN GUARD
Keith E. Brightbill, Nashville; John D. Breen, Antioch; Richard D. Williams, Brentwood, and Dennis C. Patterson, Nashville, all of Tenn., assignors to The Murray Ohio Manufacturing Co., Brentwood, Tenn.
Filed Mar. 11, 1977, Ser. No. 776,882
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—127



248,036
BICYCLE CHAIN GUARD
Richard D. Williams, Brentwood, and Dennis C. Patterson, Nashville, both of Tenn., assignors to The Murray Ohio Manufacturing Co., Brentwood, Tenn.
Filed Mar. 11, 1977, Ser. No. 776,883
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—127

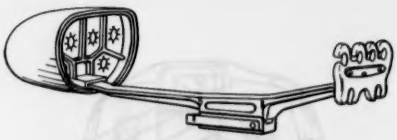
248,037
PICKUP CAMPER HOLD DOWN
Earl E. Schmitz, 123 5th Ave. SE., Beach, N. Dak. 58621
Filed Jan. 24, 1977, Ser. No. 761,581
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155



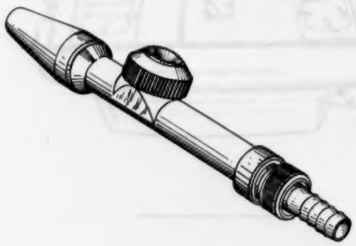
248,038
MOTOCYCLE FAIRING
Matthew P. Guzzetta, 10425 Loma Rancho Dr., Spring Valley, Calif. 92077
Filed Sep. 2, 1977, Ser. No. 830,358
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—182

248,039
KNIFE HANDLE
Phillip W. Hoffman, Reseda, Calif., assignor to Cheyenne Corporation, Westlake Village, Calif.
Filed Oct. 28, 1976, Ser. No. 736,402
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—1

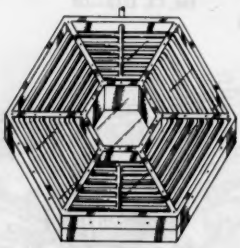
248,040
COMBINED QUIVER AND MOUNT
Robert E. Stinson, Acme, Mich., assignor to Kwikee Kwiver Co., Inc., Acme, Mich.
Filed May 17, 1976, Ser. No. 687,385
Term of patent 14 years
Int. Cl. D22—*04*
U.S. Cl. D22—13



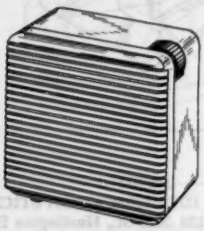
248,041
AIR GUN
Sigurd Persson, Högbergsgatan 11, 116 45 Stockholm, Sweden
Filed Jun. 15, 1976, Ser. No. 696,191
Claims priority, application Sweden, Dec. 15, 1975, 7518483
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—17



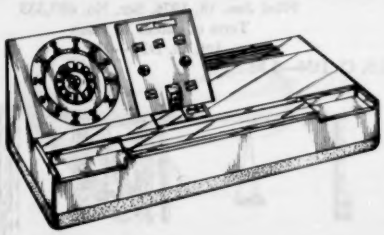
248,042
COMBINED SOLAR ENERGY COLLECTOR AND SKYLIGHT
Paul L. Ouelette, 130 Huntcliff Point, Atlanta, Ga. 30338
Filed Jun. 21, 1976, Ser. No. 698,197
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—73



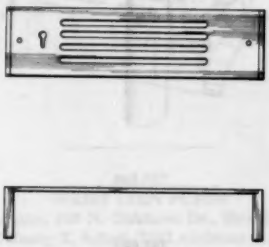
248,043
HEATER
Hans-Ulrich Schade, Pfuhl, Germany, assignor to Firma Elektro-Warme-Technik Siegfried Petz, Germany
Filed Jul. 27, 1976, Ser. No. 709,230
Claims priority, application Germany, Mar. 8, 1976, 38
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—122



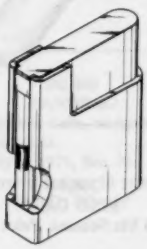
248,044
SPECIMEN SLIDE PREPARATION STATION CONSOLE OR SIMILAR ARTICLE
James A. Odom, Jr., Apple Valley, and Norbert Thomas Wolfe, Minnetonka, both of Mich., assignors to Honeywell Inc., Minneapolis, Mich.
Filed Mar. 15, 1976, Ser. No. 667,231
Term of patent 14 years
Int. Cl.[2] D24—*01*
U.S. Cl. D24—22

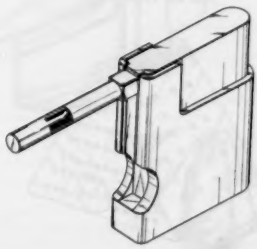


248,045
PIPETTE HOLDER OR SIMILAR ARTICLE
William W. Bassett, Wayzata, and Eugene D. Johnson, Spring Lake Park, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Mar. 15, 1976, Ser. No. 667,229
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—32



248,046
SPRAYER WITH A SWINGABLE-NESTABLE NOZZLE
Tetsuya Tada, 6-3, 2-chome, Kakinokizaka, Meguro-ku, Tokyo, Japan
Filed Sep. 23, 1977, Ser. No. 835,983
Claims priority, application Japan, Jun. 23, 1977, 52-24088
Term of patent 14 years
Int. Cl. D24—*05*
U.S. Cl. D24—99

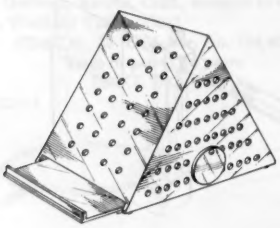




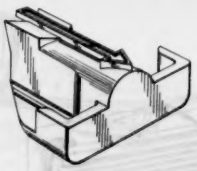
248,047
CIGARETTE LIGHTER
Seymour Rappoport, Rumson, N.J., assignor to Ronson Corporation, Woodbridge, N.J.
Filed Nov. 9, 1976, Ser. No. 740,196
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42

248,048
HAIR DRYER
Morison S. Cousins, Plainview, and Michael A. Cousins, Huntington, both of N.Y., assignors to The Gillette Company, Boston, Mass.
Filed Jul. 30, 1976, Ser. No. 710,271
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—13

248,049
BIRD CAGE
Mary J. Pedigo, 2456 Via Sonoma, Palos Verdes Estates, Calif. 90274
Filed Jul. 5, 1977, Ser. No. 813,116
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—4



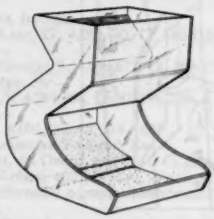
248,050
GOLF CLUB PUTTER HEAD
Herman D. Muehl, 10851 Drury La., Lynwood, Calif. 90262
Filed Dec. 2, 1976, Ser. No. 746,783
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH



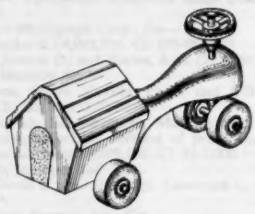
248,051
PERSONAL IDENTIFICATION STICK
Lawrence R. Klingler, 124 20th St., Huntington Beach, Calif. 92648, and Daniel E. Shook, 18935 Dallas, Perris, Calif. 92370
Filed Mar. 8, 1976, Ser. No. 661,391
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 R; D34—5 BC

248,052
THREE-POSITION SWING
Donald E. West, Coldwater, Mich., assignor to Game Time, Inc., Litchfield, Mich.
Filed Jun. 18, 1976, Ser. No. 697,333
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 M

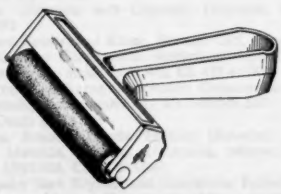
248,053
DICE TUMBLER
Gabrial A. Jacobs, and Kathy A. Turner, both of 904 Lorrie, Richardson, Tex. 75080
Filed Feb. 18, 1977, Ser. No. 769,855
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 GG



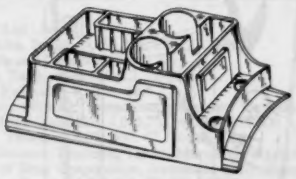
248,054
TOY VEHICLE
Lawrence Roger Harrod, Fort Wayne, Ind., assignor to Pines of America, Inc.
Filed Sep. 20, 1976, Ser. No. 724,961
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ



248,055
BRAYER
Francis W. MacGregor, New Britain, Conn., assignor to Hunt Manufacturing Co., Philadelphia, Pa.
Filed Nov. 3, 1976, Ser. No. 738,348
Term of patent 14 years
Int. Cl. D18—*99;* D8—*05*
U.S. Cl. D64—18

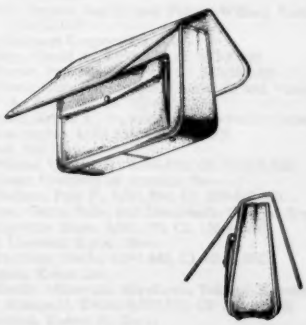


248,056
VEHICLE CONSOLE
John P. Nepper, 9826 Hartman, Omaha, Nebr. 68134
Filed Jun. 6, 1977, Ser. No. 804,106
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D87—1 R



248,057
WRIST COIN PURSE
Nancy E. Heimler, 310 N. Oakhurst Dr., Beverly Hills, Calif. 90210, and Ronny K. Schnel, 9242 Airdrome St., Los Angeles, Calif. 90035
Filed Nov. 10, 1975, Ser. No. 630,137
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 B

248,058
HANDBAG
Milton I. Siegel, Scottsdale, Ariz., assignor to Amba Marketing Systems, Inc., Tempe, Ariz.
Filed July 6, 1976, Ser. No. 702,441
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 D



248,059

PUSH SYMBOL FOR GLASS DOORS OR THE LIKE

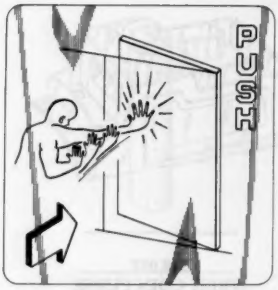
Jack Darrell, 1646 Old Spanish Trail, Houston, Tex. 77054

Filed May 9, 1977, Ser. No. 795,053

Term of patent 14 years

Int. Cl. D20—*03;* D8—*99*

U.S. Cl. D96—12 C



248,060

PUSH SYMBOL FOR GLASS DOORS OR THE LIKE

Jack Darrell, 1646 Old Spanish Trail, Houston, Tex. 77054

Filed May 25, 1977, Ser. No. 800,253

Term of patent 14 years

Int. Cl. D20—*03;* D8—*99*

U.S. Cl. D96—12 C

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 30TH DAY OF MAY, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. R. F. Products, Inc.: *See*—
Stolarczyk, Larry G., 4,092,643, Cl. 340-416.000.

A-T-O Inc.: *See*—
Mountford, George S., 4,091,872, Cl. 169-37.000.

AB Bahco Verktyg: *See*—
Wahlberg, Ulf, 4,091,696, Cl. 81-396.000.

AB Carbox: *See*—
Trolle, Sten, 4,091,938, Cl. 214-1.00F.

AB Norbergs Mekaniska Verkstad: *See*—
Hammarqvist, Bo Georg, 4,091,941, Cl. 214-38.00D.

Abbott, Arthur Robert; and Milliken, Walter Clark, to Sensor-Matic, Inc. Digital differential pressure measurement apparatus. 4,091,682, Cl. 73-702.000.

Abbott, Dennis Roland. Accommodation for temporary manning of vessels. 4,091,581, Cl. 52-79.100.

Abbott Laboratories: *See*—
Crovetti, Aldo Joseph, 4,092,433, Cl. 424-331.000.
Mao, James Chieh-Hsiu; Seely, John Hunter; and Fairgrieve, John Scott, 4,092,412, Cl. 424-212.000.

Abcor, Inc.: *See*—
Kummer, Frederick J., 4,092,246, Cl. 210-65.000.

Abe, Hiroaki: *See*—
Komiyama, Yoshizo; Nakamura, Hiromi; and Abe, Hiroaki, 4,091,970, Cl. 222-596.000.

Abel, Heinz; and Berger, Alfred, to Ciba-Geigy Corporation. Process for removing foam from aqueous systems and composition useful therein. 4,092,266, Cl. 252-321.000.

Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, to American Home Products Corporation. Method of inducing abortion using alkyl derivatives of prostanoic acids. 4,092,427, Cl. 424-317.000.

Adamitis, John P., to Raymond Lee Organization, Inc., The. Harmonica horn. 4,091,703, Cl. 84-378.000.

Adams, Jay W. Compatible composite image process. 4,092,673, Cl. 358-183.000.

Addressograph-Multigraph Corp.: *See*—
Beck, Charles K., 4,092,526, Cl. 235-487.000.
Jackson, Jerome E.; and Blades, John D., 4,092,160, Cl. 96-1.00R.

Adlercreutz, Herman: *See*—
Suovaniemi, Osmo; Virkola, Pertti; and Adlercreutz, Herman, 4,092,120, Cl. 23-253.0TP.

Adolphi, Heinrich; Schwarzmann, Matthias; and Heinze, Peter, to BASF Aktiengesellschaft. Method of protecting wood with perfluoroalkane sulfonates. 4,092,110, Cl. 21-7.000.

Advance Lifts, Incorporated: *See*—
Clarke, David E.; and Richards, Lawrence I., 4,091,906, Cl. 192-129.00A.

Advance Weight Systems, Inc.: *See*—
Oxley, Arthur R., 4,091,885, Cl. 177-188.000.

AEG-Elotherm, G.m.b.H.: *See*—
von Starck, Axel; and Gerbig, Hans-Erwin, 4,092,086, Cl. 417-50.000.

Aeroquip Corporation: *See*—
Crissy, Charles F.; and Corbin, Christopher L. T., 4,091,744, Cl. 105-475.000.

Aesculapius Scientific Limited: *See*—
Hardy, Stanley Matthias, 4,092,113, Cl. 23-230.00B.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Chronberg, Sten, 4,092,231, Cl. 204-181.00F.
Demazeau, Gerard; Maestro, Patrick; Plante, Theophile; Pouchard, Michel; and Hagenmuller, Paul, 4,092,439, Cl. 423-607.000.

Agfa-Gevaert, N.V.: *See*—
Lemahieu, Raymond Gerard; Depoorter, Henri; and Vanassche, Willy Joseph, 4,092,168, Cl. 96-84.00R.

Aginsky, Jacob. Intramedullary compression nail for the treatment of bone fractures. 4,091,806, Cl. 128-92.0BC.

Agip Nucleare, S.p.A.: *See*—
Brambilla, Giovanni; and Caporali, Giacomo, 4,092,397, Cl. 423-5.000.

Agnihotri, Ram Kumar; and Kluge, Herman Carl, II, to International Business Machines Corporation. Method of depositing thin films utilizing a polyimide mask. 4,092,442, Cl. 427-41.000.

Agulnek, Martin A., to Xerox Corporation. Crossover arrangement for multiple scanning arrays. 4,092,632, Cl. 340-146.30F.

Aichi Tokei Denki K.K.: *See*—
Namikawa, Kosuke; Onoda, Hajime; Okamoto, Mineo; Fujii, Isamu; Matsuda, Takaaki; Uebayashi, Mustuo; and Suzuki, Hirosi, 4,091,668, Cl. 73-263.000.

Aihara, Takayuki; Hori, Kiyoshi; and Morokuma, Tadashi, to Olympus Optical Company Limited. Detecting head for use in an apparatus for reading optically an information recorded on a record carrier as a track or tracks. 4,092,529, Cl. 250-201.000.

Aikoh Co., Ltd.: *See*—
Yanagioka, Seiichi, 4,092,025, Cl. 273-72.00R.

Air Products and Chemicals, Inc.: *See*—
Cebalo, Tony, 4,092,148, Cl. 71-90.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Ishikawa, Hitoshi; Yamamoto, Kimihiko; Sawada, Toshio; and Kasahara, Takahiko, 4,091,755, Cl. 112-279.000.
Miyao, Takayuki, 4,091,690, Cl. 74-865.000.

Akazawa, Susumu; Tsuchiya, Takao; Murakami, Kyoichi; and Okada, Takashi, to Sony Corporation. Automatic chrominance control and color killer circuits. 4,092,667, Cl. 358-26.000.

Akiyama, Satoshi, to Kabushiki Kaisha Shikutani. Mowing apparatus. 4,091,538, Cl. 30-276.000.

Akiyama, Yasutaka; and Iijima, Yoshio, to Sumitomo Electric Industries, Ltd.; and Japan Aviation Electronics Industries Ltd. Apparatus for mounting a connector to coated wires. 4,091,515, Cl. 29-33.00M.

Aktiebolaget Atomenergi: *See*—
Margen, Peter Heinrich Erwin, 4,091,636, Cl. 62-238.000.

Aktiebolaget IRO: *See*—
Jacobsson, Kurt Arne Gunnar, 4,092,006, Cl. 242-47.010.

A.G. fur Industrielle Elektronik AGIE b. Locarno: *See*—
Peddinghaus, Gunther; Neumann, Harry; and Wittenstein, Horst, 4,092,091, Cl. 425-62.000.

Aktieselskabet de Danske Sukkerfabrikker: *See*—
Madsen, Rud Frik, 4,092,247, Cl. 210-67.000.

Akzona Incorporated: *See*—
Beck, Heinz; and Schlichtmann, Gerhard, 4,092,107, Cl. 8-116.00R.
Oosterwijk, Hendrik Harm Jannes; and Torenbeek, Reinder, 4,092,470, Cl. 526-227.000.

Alasia, Alfred V. Encoding system. 4,092,654, Cl. 354-112.000.

Albert Handtmann, Firma: *See*—
Muller, Johann; and Staudenrausch, Georg, 4,091,505, Cl. 17-33.000.

Albright, Jay Donald: *See*—
Hanifin, John William, Jr.; Moran, Daniel Bryan; Albright, Jay Donald; and Allen, George Rodger, Jr., 4,092,311, Cl. 544-224.000.

Albright & Wilson Limited: *See*—
Jones, Trevor Eric, 4,092,340, Cl. 260-429.700.

Alcon Laboratories, Inc.: *See*—
Helixon, Michael L.; and Ward, Barry S., 4,091,812, Cl. 128-218.00D.

Alden, David G.: *See*—
Schrenk, Lorenz P.; Datta, James R.; and Alden, David G., 4,091,550, Cl. 35-19.00A.

Aleck, Benjamin J.: *See*—
Markow, Edward G.; and Aleck, Benjamin J., 4,092,180, Cl. 148-12.00E.

Alexander, Robert L., to Hunt Manufacturing Co. Hanging file support frame. 4,091,933, Cl. 211-204.000.

Allen, George Rodger, Jr.: *See*—
Hanifin, John William, Jr.; Moran, Daniel Bryan; Albright, Jay Donald; and Allen, George Rodger, Jr., 4,092,311, Cl. 544-224.000.

Allen, Michael L. Skin cleansing device. 4,091,490, Cl. 15-159.00A.

Allied Chemical Corporation: *See*—
Sibilia, John P.; and Vrooman, Bernard Harlow, 4,091,855, Cl. 152-359.000.
Van Peppen, Jan F.; and Fisher, William Bernard, 4,092,360, Cl. 260-586.00P.

Allis-Chalmers Corporation: *See*—
Berg, David A., 4,091,877, Cl. 172-9.000.
Harrer, Paul H., 4,091,964, Cl. 221-266.000.
Sieren, Gerald E.; Sippel, LLoyd F.; and VandenHeuvel, George A., 4,091,905, Cl. 192-113.00B.

Altemose, Arthur L., Jr., to Avco Corporation. Detonation analyzer for piston engine. 4,091,656, Cl. 73-35.000.

Alumax, Inc.: *See*—
Wilcox, Clinton H., 4,091,652, Cl. 72-312.000.

Aluminum Company of America: *See*—
Wallace, Paul F., 4,091,954, Cl. 220-470.000.

Alwood, Gloria Belle; and Dimitriadis, George. Repair of polystyrene refrigerator liners. 4,092,195, Cl. 156-94.000.

AMA Universal S.p.A.: *See*—
Zucchini, Guido, 4,091,643, Cl. 68-18.00C.

Amagami, Keizo: *See*—
Kiuchi, Mitsuyuki; Mizukawa, Takumi; Kominami, Hideyuki; and Amagami, Keizo, 4,092,510, Cl. 219-10.49R.

Ambroziak, Robert E.: *See*—
Leverenz, John H.; Mocho, John H.; and Ambroziak, Robert E., 4,092,004, Cl. 241-56.000.

Amedei, Giuseppe; Quilico, Carlo Alberto; and Maggioni, Virginio, to

FIAT Societa per Azioni. Control device for a motor vehicle pneumatic braking system. 4,092,047, Cl. 303-22.00R.

American Chemical & Refining Co., Inc.: *See—*
Dietz, George, Jr.; and Skomoroski, Robert M., 4,092,154, Cl. 75-109.000.

American Cyanamid Company: *See—*
Ashkar, Saleh Abdul-Kadir, 4,092,147, Cl. 71-76.000.
Behrens, Rudolf Adolf, 4,092,303, Cl. 260-79.50P.
Hanifin, John William, Jr.; Moran, Daniel Bryan; Albright, Jay Donald; and Allen, George Rodger, Jr., 4,092,311, Cl. 544-224.000.
Pinto, Frank George; and Kaplan, Earl, 4,092,455, Cl. 428-295.000.
Suen, Tzeng Jiueq; and Begala, Arthur James, Jr., 4,092,244, Cl. 210-58.000.
Welcher, Richard P.; Rabinowitz, Robert; and Cibulskas, Algird S., 4,092,467, Cl. 526-80.000.

American Home Products Corporation: *See—*
Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, 4,092,427, Cl. 424-317.000.
Henderson, Gary A.; and Williams, Guy H., 4,092,695, Cl. 361-232.000.

American Multi-Lert Corporation: *See—*
Hartkorn, Albert W., 4,091,741, Cl. 105-366.00R.

American Optical Corporation: *See—*
Hansen, Donald H.; and Waltuck, Morey H., 4,092,574, Cl. 318-265.000.
Thaler, Sherwood Sheldon, 4,091,817, Cl. 128-419.0PG.

Amey, Guy C. Air sampling pump. 4,091,674, Cl. 73-421.50R.

AMF Incorporated: *See—*
Warner, Roger Kenneth, 4,092,727, Cl. 364-900.000.

AMP Incorporated: *See—*
Davis, Thomas Francis, 4,092,225, Cl. 204-47.000.
Grubb, Daniel Baker; Schumacher, William Ludlow; and Volinskie, Robert, 4,091,531, Cl. 29-749.000.
Kotaka, Yasumasa, 4,092,504, Cl. 200-16.00D.

Amrine, Bruce A.; and Teders, Philip J., to Sarns, Inc. Temperature probe and connector. 4,091,672, Cl. 73-343.00R.

Analog Devices, Incorporated: *See—*
Brefka, Paul E., 4,092,698, Cl. 361-399.000.

Anderson, Gordon K.; and Leuck, Steven M. Combination temperature, wind and chill factor instrument. 4,091,667, Cl. 73-170.00R.

Anderson, Ingvar G.: *See—*
Mackenzie, Harold B.; and Anderson, Ingvar G., 4,092,241, Cl. 209-127.00A.

Anderson, Olof Verner, to Anson Incorporated. Writing instrument with bayonet lock. 4,092,073, Cl. 401-209.000.

Anderson, Oscar A., to United States of America, Energy. Charge exchange system. 4,092,534, Cl. 250-251.000.

Ando, Shizuo; and Mizuno, Hiroshi, to Pioneer Electronic Corporation. Variable impedance detecting circuit for a telephone line auxiliary device. 4,092,496, Cl. 179-6.00R.

Andreas Stihl, Firma: *See—*
Wieland, Dieter; and Schurr, Volker, 4,091,896, Cl. 188-166.000.

Andrepont, John S., to Chicago Bridge & Iron Company. Hydraulic counterweight and shock-absorbing system. 4,091,897, Cl. 188-314.000.

Andrews, Thomas L., Jr.; and Mendenhall, Charles E., to Sperry Rand Corporation. Cross coupled demodulator for generating a servo head position error signal. 4,092,682, Cl. 360-77.000.

Andrews, Thomas L., Jr.; and Mendenhall, Charles E., to Sperry Rand Corporation. Dual-mode demodulator for movement of a servo head. 4,092,683, Cl. 360-77.000.

Andrus, Paul G.; Ullrich, Osmar A.; and Hardenbrook, James M., to Xerox Corporation. Method of making a donor member mold. 4,092,165, Cl. 96-38.200.

Anson Incorporated: *See—*
Anderson, Olof Verner, 4,092,073, Cl. 401-209.000.

Anthony, David S.; and Turner, Leonard M., Jr. Air operated pump. 4,092,087, Cl. 417-131.000.

Antus, Sandor: *See—*
Farkas, Lorand; Nogradi, Mihaly; Pfliegel, Todor; Antus, Sandor; and Gottsegen, Agnes, 4,092,346, Cl. 260-511.000.

Aoki, Hatsuo; Nishiura, Toyozi; and Imanaka, Hiroshi, to Fujisawa Pharmaceutical Co., Ltd. Antibacterial composition. 4,092,411, Cl. 424-114.000.

Aono, Shunji: *See—*
Suzuki, Yoshio; Minai, Masayoshi; Hamma, Noritaka; Murayama, Eiichi; and Aono, Shunji, 4,092,324, Cl. 260-295.50R.

Appel, Adolf; and Reymann, Wolfgang, to Gildemeister Corpoplast GmbH. Apparatus for blow-molding hollow articles, in particular bottles. 4,092,097, Cl. 432-11.000.

Appel, Douglas C.: *See—*
Babish, John A.; Arnot, Larry K.; and Appel, Douglas C., 4,091,865, Cl. 165-95.000.

Aqua-Marine Mfg. Limited: *See—*
McMaster-Christie, Colin, 4,092,085, Cl. 417-44.000.

Arai, Haruhiko: *See—*
Nishimura, Masaaki; and Arai, Haruhiko, 4,092,272, Cl. 252-545.000.

Arai, Shigeru; Ito, Keiichi; Ogawa, Kinya; Kurimoto, Kazuhiko; and Shirota, Yoshihiro, to Shin-Etsu Chemical Co., Ltd. Method for removing unreacted monomers from aqueous dispersions of polymerizate. 4,092,471, Cl. 528-502.000.

Arakawa Rinsan Kagaku Kogyo Kabushiki Kaisha: *See—*
Oishi, Toshio; Kitano, Takashi; Sasaki, Hiroshi; and Yamashita, Tetuo, 4,092,283, Cl. 260-27.0BB.

Arbib, Gordon Francis; and Rubin, Wallace, to Multicore Solders Limited. Soldering flux composition. 4,092,182, Cl. 148-23.000.

Armstrong Cork Company: *See—*
Dieck, Ronald L.; Goldfarb, Louis; and Hann, Nancy D., 4,092,278, Cl. 260-2.50R.

Arnold, Frances T.: *See—*
Lowthorp, Ernest C., deceased; Arnold, Frances T.; Winters, Luther R., Jr.; and Lippert, Roy, 4,091,765, Cl. 118-658.000.

Arnold, Werner: *See—*
Meisner, Alfred; Arnold, Werner; and Ennen, Peter, 4,091,612, Cl. 58-85.500.

Arnot, Larry K.: *See—*
Babish, John A.; Arnot, Larry K.; and Appel, Douglas C., 4,091,865, Cl. 165-95.000.

Arp, Ewald A. Container crushing device. 4,091,725, Cl. 100-45.000.

Arth, Glen E.; and Wood, Sumner, Jr., deceased (Wood, Linda S. Windsor, administratrix), to Merck & Co., Inc. Antiandrogens as platelet aggregation inhibitors. 4,092,413, Cl. 424-241.000.

Artzberger, Thomas G., to Kelley Company Inc. Dockboard utilizing a gas spring for counterbalancing. 4,091,488, Cl. 14-71.700.

Asahi Dow Limited: *See—*
Hasegawa, Takanori; and Tsuji, Yoshio, 4,091,727, Cl. 101-128.200.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Miyake, Tetsuya; Seko, Maomi; Takeda, Kunihiko; Ikeda, Akihiko; and Imamura, Kazuo, 4,092,398, Cl. 423-7.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Kawasaki, Masahiro; Tano, Eiichi; and Sawada, Yoshio, 4,092,653, Cl. 354-60.00L.

Aschwanden, Felix, to RCA Corporation. Master oscillator synchronizing system. 4,092,672, Cl. 358-149.000.

Ascoli, Enzo, to Gillette Company, The. Rechargeable battery-operated shaver with printed circuit module mounting brush means, batteries and switch means. 4,092,581, Cl. 320-2.000.

Ashkar, Saleh Abdul-Kadir, to American Cyanamid Company. Method for controlling the relative stem growth of plants. 4,092,147, Cl. 71-76.000.

Ashkin, Arthur; and Dziedzic, Joseph Martin, to Bell Telephone Laboratories, Incorporated. Damping of optically levitated particles by feedback and beam shaping. 4,092,535, Cl. 250-251.000.

Aspenlind, Ake Lars. G. Gas cylinder washing, draining and/or drying apparatus. 4,091,495, Cl. 15-304.000.

Aspin, Anthony Frank, to Aspin Shaw, Ltd.; Francis Shaw & Co. Ltd.; and Pakord Ltd. Twine and method of forming same. 4,091,607, Cl. 57-140.00R.

Aspin Shaw, Ltd.: *See—*
Aspin, Anthony Frank, 4,091,607, Cl. 57-140.00R.

Associated Electrical Industries Limited: *See—*
Markham, John David, 4,092,577, Cl. 318-370.000.

Associated Mills, Inc.: *See—*
Peterson, Samuel F., 4,091,998, Cl. 239-283.000.

Atlantic Richfield Company: *See—*
Leonard, John Joseph; and Kao, Jar-Lin, 4,092,355, Cl. 260-530.00N.
Narayan, Kailash; and Pick, Richard D., 4,092,399, Cl. 423-7.000.

Aubert, Gilles, to Commissariat a l'Energie Atomique. Nuclear reactor. 4,092,216, Cl. 176-50.000.

Austin, Buddy Julian, to Roper Corporation. Work coil for use in an induction cooking appliance. 4,092,511, Cl. 219-10.49R.

Automation Feeding Devices Pty Limited: *See—*
Sanderson, Gordon Francis; and Burge, Anthony George, 4,091,597, Cl. 53-59.00R.

Autophon Aktiengesellschaft: *See—*
Zimmermann, Alois; and Muller, Hansruedi, 4,092,600, Cl. 325-55.000.

Avco Corporation: *See—*
Altemose, Arthur L., Jr., 4,091,656, Cl. 73-35.000.
Lagasse, Normand L.; and Cuny, Richard P., 4,091,663, Cl. 73-136.00R.
Ogman, Abraham, 4,091,635, Cl. 62-123.000.
Williams, Millard M.; and Stelzer, Robert A., 4,091,602, Cl. 56-14.400.

Avco Everett Research Laboratory, Inc.: *See—*
von Rosenberg, Charles W., Jr.; Ewing, James J.; Center, Robert E.; and Chen, Hao-Lin, 4,092,405, Cl. 423-580.000.

Avery Products Corporation: *See—*
Douek, Maurice; Schmidt, Gustav A.; Malofsky, Bernard M.; and Hauser, Martin, 4,092,374, Cl. 260-873.000.
Douek, Maurice; Schmidt, Gustav A.; Malofsky, Bernard M.; and Hauser, Martin, 4,092,376, Cl. 260-884.000.

AVM Corporation: *See—*
Signore, Dennis J.; and Stark, Forest G., 4,092,056, Cl. 312-219.000.

Axelrod, Herbert R. Method for binding books. 4,091,487, Cl. 11-1.0AD.

Ayotte, Gordon, to Raymond Lee Organization, Inc., The, a part interest. Nut shelling device. 4,091,534, Cl. 30-120.200.

Azuma, Akira: *See—*
Ogishi, Masaaki; and Azuma, Akira, 4,092,575, Cl. 318-282.000.

B. & J. Manufacturing Company: *See—*
Jensen, Wayne Emil; and Stanfield, Charles Keith, 4,091,516, Cl. 29-79.000.

Babish, John A.; Arnot, Larry K.; and Appel, Douglas C., to Wynn Oil Company. Air-pressurized, safety anti-freeze tank. 4,091,865, Cl. 165-95.000.

Bade, Walter. Handle for files and similar tools. 4,091,497, Cl. 16-110.00R.

Bagli, Jehan F.: *See*—
Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, 4,092,427, Cl. 424-317.000.

Bahrke, Ludwig, to Hoesch Werke Aktiengesellschaft. Method for degreasing rolling mill scale. 4,091,826, Cl. 134-11.000.

Baier, Robert E.; and DePalma, Vito A., to Calspan Corporation. Environmental quality indicator. 4,092,119, Cl. 23-253.0TP.

Baker, Albert B., to International Recycling Enterprises, Ltd. Recovery of unoxidized metals from organic insulated metallic scrap. 4,091,825, Cl. 134-2.000.

Baker, Roger Thomas. Three electrode dynamic semiconductor memory cell with coincident selection. 4,092,736, Cl. 365-189.000.

Baker, William, to Masco Corporation of Indiana. Crystalless scanning radio receiver controlled by processing means. 4,092,594, Cl. 325-21.000.

Baldwin, John J., to Merck & Co., Inc. Substituted (3-loweralkylamino-2-R_1O-propoxy)pyridines, their preparation and use. 4,092,419, Cl. 424-263.000.

Baldwin, Richard J. Non-air breathing option for an internal combustion engine. 4,091,769, Cl. 123-1.00A.

Balevski, Angel Tonchev; Nikolov, Ivan Dimov; Mateev, Evgeni Hristov; Trifonov, Todor Kostadinov; and Kojuharov, Vassil Vladimirov, to Institute Po Metaloznanie I Technologia Na Metalite. Method of producing molded parts with a smooth noncellular skin and a cellular core from foamable thermoplastic material. 4,092,385, Cl. 264-45.500.

Balthrop, Chris A.: *See*—
Daboub, Henry A.; Henderson, Charles R.; and Balthrop, Chris A., 4,092,525, Cl. 235-463.000.

Baltzer, Philip Keene, to RCA Corporation. Parallel access memory system. 4,092,728, Cl. 364-900.000.

Banker, Bernard R.: *See*—
Hildebrant, Floyd J.; and Banker, Bernard R., 4,092,187, Cl. 149-11.000.

Barber-Colman Company: *See*—
Stark, Ernest H., 4,091,992, Cl. 236-44.00C.

Barber, Lionel, personal representative: *See*—
Dowty, George Herbert, deceased; Lilley, Virginia Anne, personal representative; Barber, Lionel, personal representative; and Kneale, Peter James, personal representative, 4,091,838, Cl. 137-528.000.

Barbier, Robert. Silent declarer. 4,092,026, Cl. 273-148.00R.

Barclay, Donald John; Bird, Colin Leonard; Hallett, Michael Henry; Kirkman, David Horrobin; Minshull, John Francis; and Owen, Charles Edward, to International Business Machines Corporation. Liquid electrolyte type electrochromic display device. 4,092,637, Cl. 340-324.00R.

Barker International, Inc.: *See*—
Fox, Gaston M.; and Wright, Thomas H., 4,091,503, Cl. 17-11.000.

Barksdale, Richard D.: *See*—
Handy, Richard L.; Ferguson, Eldon Glen; Barksdale, Richard D.; Fox, Nathaniel S.; and Trott, Gary, 4,091,661, Cl. 73-88.00E.

Barlow, Gordon A.; Brand, Derek A.; and Imatt, Alex, to Marvin Glass & Associates. Toy vehicle track. 4,091,995, Cl. 238-10.00A.

Baritrop, Austin, to South African Inventions Development Corporation of Scientia, The. Rotor for an autogiro. 4,092,084, Cl. 416-102.000.

Barouh, Victor; Rottmann, George; and Giaccone, Sylvester. Composition for a typewriter ribbon having delayed alteration resistance. 4,092,280, Cl. 260-23.0XA.

Barrett, Harrison H., to Raytheon Company. Radiographic camera with internal mask. 4,092,540, Cl. 250-363.00S.

Barriquand: *See*—
Gaignoux, Daniel Clement; and Pinot, Jean-Pierre, 4,092,111, Cl. 21-93.000.

Bartha, Zoltan: *See*—
Mikes, Sandor; Timar, Matyas; and Bartha, Zoltan, 4,091,843, Cl. 138-127.000.

Bartholomew, Mark R. Rotary cutting device. 4,091,536, Cl. 30-276.000.

BASF Aktiengesellschaft: *See*—
Adolphi, Heinrich; Schwarzmann, Matthias; and Heinze, Peter, 4,092,110, Cl. 21-7.000.
Gruber, Wolfgang; Frielingsdorf, Hans; and Mueller-Tamm, Heinz, 4,092,468, Cl. 526-105.000.
Schenk, Walter; Schlecht, Helmut; and Gotsmann, Guenther, 4,092,347, Cl. 260-513.00R.
Theysohn, Rainer; Wurmb, Rolf; Seydl, Wolfgang; and Zahradnik, Franz, 4,092,284, Cl. 260-28.00R.
Wurmb, Rolf; Beck, Fritz; and Boehlke, Klaus, 4,092,463, Cl. 429-105.000.

BASF Wyandotte Corporation: *See*—
Narayan, Thirumurti, 4,092,276, Cl. 260-2.5AB.

Basler, Walter: *See*—
Schmid, Wolfgang; Basler, Walter; and Burckhardt, Urs, 4,092,415, Cl. 424-250.000.

Bates, David A.; and Capritta, Angelo T., to Baxter Travenol Laboratories, Inc. Needle cover. 4,091,811, Cl. 128-214.400.

Batey, John E.: *See*—
Berlad, Abraham L.; Saizano, Francis J.; and Batey, John E., 4,091,592, Cl. 52-616.000.

Battelle Development Corporation: *See*—
Haidinger, Walter, 4,092,227, Cl. 204-59.00R.
Stambaugh, Edgel P.; and Chauhan, Satya P., 4,092,125, Cl. 44-1.00R.

Battelle Memorial Institute: *See*—
Giess, Herbert; Burrows, Brian; and Janssoone, Marie-Michelle, 4,092,462, Cl. 429-50.000.

Bauer, Lothar, to Siemens Aktiengesellschaft. Device for suppressing multiple registrations in a data store. 4,092,731, Cl. 364-900.000.

Bauer, Robert: *See*—
Rupe, Chauncey Orvis; and Bauer, Robert, 4,092,115, Cl. 23-230.00R.

Bauerkemper, Michael I.: *See*—
McCartney, Ronald L.; Hogan, Vaughn C.; Landgreen, Eleanor A.; and Bauerkemper, Michael I., 4,092,396, Cl. 264-249.000.

Baxter Travenol Laboratories, Inc.: *See*—
Bates, David A.; and Capritta, Angelo T., 4,091,811, Cl. 128-214.400.
Fowles, Thomas A.; and Winchell, David A., 4,091,949, Cl. 215-251.000.
Holmes, Richard D.; and Wang, Cheng L., 4,092,520, Cl. 219-504.000.
Parsons, George H., Jr.; and Eller, Thomas, 4,092,479, Cl. 548-312.000.
Warner, Roger M., 4,092,635, Cl. 340-235.000.

Bay-Schmith, Niels. Method and apparatus for loading a vehicle with bales of crop material or similar units. 4,091,943, Cl. 214-152.000.

Bayer Aktiengesellschaft: *See*—
Bocker, Ernst; Kracht, Wolfgang; Rupp, Roland; Schellmann, Erhard; Trescher, Viktor; and Ullrich, Martin, 4,092,089, Cl. 425-10.000.
Neuray, Dieter; Vernaleken, Hugo; and Rudolph, Hans, 4,092,243, Cl. 210-41.000.
Noll, Klaus; Grammel, Jurgen; and Meckel, Walter, 4,092,286, Cl. 260-29.2TN.
Reischl, Artur; Jabs, Gert; Dietrich, Werner; and Gonzalez-Dorner, Alberto Carlos, 4,092,275, Cl. 260-2.5BD.
Wolf, Wilhelm, 4,092,353, Cl. 260-525.000.

Bayly, Peter Kingsley, to Wiltshire Cutlery Company Proprietary Ltd. Knife sharpener. 4,091,691, Cl. 76-86.000.

Bazarov, Jury Alexeevich: *See*—
Khutoretsky, Garri Mikhailovich; Zverev, Anatoly Timofeevich; Belova, Tamara Nikolaevna; Bazarov, Jury Alexeevich; and Gurevich, Elrikh Iosifovich, 4,091,528, Cl. 29-596.000.

Beck, Charles K., to Addressograph-Multigraph Corp. Secure property device. 4,092,526, Cl. 235-487.000.

Beck, Fritz: *See*—
Wurmb, Rolf; Beck, Fritz; and Boehlke, Klaus, 4,092,463, Cl. 429-105.000.

Beck, Heinz; and Schlichtmann, Gerhard, to Akzona Incorporated. Process for finishing textile materials containing cellulose fibers. 4,092,107, Cl. 8-116.00R.

Becker, Robert. Unitized power outlet housing for truck tractor body. 4,092,034, Cl. 280-420.000.

Beckman Instruments, Inc.: *See*—
Zichis, Joseph, 4,092,409, Cl. 424-12.000.

Beecham Group Limited: *See*—
Bentley, Peter Hubert; and Clayton, John Peter, 4,092,476, Cl. 544-26.000.

Begala, Arthur James, Jr.: *See*—
Suen, Tzeng Jiueq; and Begala, Arthur James, Jr., 4,092,244, Cl. 210-58.000.

Beghi, Giorgio: *See*—
Cocuzza, Gioacchino; and Beghi, Giorgio, 4,091,864, Cl. 165-1.000.

Behrens, Rudolf Adolf, to American Cyanamid Company. Polyacrylate elastomers with improved elasticity. 4,092,303, Cl. 260-79.50P.

Beilstein, Kenneth Edward, Jr.; and Kotecha, Harish Narandas, to International Business Machines Corporation. Substrate bias modulation to improve mosfet circuit performance. 4,092,548, Cl. 307-205.000.

Beitner, Shlomo, to Bipol Ltd. Dental desk unit. 4,092,138, Cl. 62-3.000.

Bell, Frank H.; Borcherding, Ronald L.; Munson, William O.; McDonald, Michael S.; and Peterson, John A., to United States of America, Army. Low vulnerability booster charge caseless ammunition. 4,091,729, Cl. 102-38.000.

Bell & Howell Company: *See*—
Browder, Lewis B., 4,091,979, Cl. 226-7.000.

Bell & Howell Limited: *See*—
Fehr, Ivor John Martin; and Wheable, Desmond, 4,091,669, Cl. 73-299.000.

Bell Telephone Laboratories, Incorporated: *See*—
Ashkin, Arthur; and Dziedzic, Joseph Martin, 4,092,535, Cl. 250-251.000.
Frazer, Gerald Lee, 4,092,491, Cl. 178-67.000.
Jackson, Jesse Milne, 4,091,657, Cl. 73-40.000.
Rabiner, Lawrence Richard; and Sambur, Marvin Robert, 4,092,493, Cl. 179-1.0SD.
Selkow, Charles Fred, Jr., 4,092,587, Cl. 324-28.00R.

Bellinghausen, Thomas A.; and Gilman, Gareld I., to Statitrol Corporation. Security interlock switch system for smoke detectors and the like. 4,092,641, Cl. 340-409.000.

Bellus, Daniel: *See*—
Fischer, Hanspeter; and Bellus, Daniel, 4,092,146, Cl. 71-70.000.

Belova, Tamara Nikolaevna: *See*—
Khutoretsky, Garri Mikhailovich; Zverev, Anatoly Timofeevich; Belova, Tamara Nikolaevna; Bazarov, Jury Alexeevich; and Gurevich, Elrikh Iosifovich, 4,091,528, Cl. 29-596.000.

Benda, Karl. Frame apparatus. 4,091,639, Cl. 63-18.000.

Bendix Corporation, The: *See*—
Gunda, Rajamouli, 4,091,773, Cl. 123-32.0EA.

Tsang, Peter Hing-Shya; Hradek, Richard W.; and Bode, James Daniel, 4,092,264, Cl. 252-186.000.
Beneker, Claus; and La Salle, Stanley G., to Bertea Corporation. Pressure plug and method. 4,091,841, Cl. 138-89.000.
Benerito, Ruth R.: *See*—
Berni, Ralph J.; Benerito, Ruth R.; and Pilkington, Mary W., 4,092,106, Cl. 8-115.700.
Bennett, James Gordy, Jr.; and Cooper, Glenn Dale, to General Electric Company. Method for preparing polyphenylene ethers. 4,092,294, Cl. 260-47.0ET.
Bennett, Joseph C.: *See*—
Funcik, Jack F.; Bennett, Joseph C.; and Fusco, Vito A., deceased, 4,091,695, Cl. 81-9.510.
Bennett, Robert Gordon, Jr.; and Bonnanzio, Richard Louis, to USM Corporation. Roll supports with hydrostatic and roller bearings. 4,092,048, Cl. 308-9.000.
Benroth, Emory E., to Raymond Lee Organization, Inc., The. Vegetable chopper. 4,092,005, Cl. 241-168.000.
Bentley, Peter Hubert; and Clayton, John Peter, to Beecham Group Limited. Phthalidyl esters of 7-[(α amino, 2 substituted acetamido)-3-(heterocyclic-thio methyl)]cephalosporins. 4,092,476, Cl. 544-26.000.
Berg, Christoph: *See*—
Knothe, Erich; Berg, Christoph; and Stadler, Eberhard, 4,091,886, Cl. 177-210.0EM.
Berg, David A., to Allis-Chalmers Corporation. Position and draft control subassembly and bracket for removable mounting thereof. 4,091,877, Cl. 172-9.000.
Berg, Robert L.; and Murphy, William J., to McDonnell Douglas Corporation. Control means and method for controlling an object. 4,092,716, Cl. 364-424.000.
Berger, Alfred: *See*—
Abel, Heinz; and Berger, Alfred, 4,092,266, Cl. 252-321.000.
Berger, Horst: *See*—
Schlosser, Werner; and Berger, Horst, 4,092,018, Cl. 269-234.000.
Bergersen, Hans Amund, to Patentkonsortiet Robert Meinich & Co. Continuous web consisting of resistance foil material between two insulating foil layers and method for the production of such webs. 4,092,626, Cl. 338-212.000.
Bergfjord, John A.: *See*—
Radler, Richard W., Jr.; Millonzi, Richard P.; and Bergfjord, John A., 4,092,161, Cl. 96-1.50R.
Bergk, Berndt; Lilienbeck, Klemens; Ottmann, Gerhard Friedrich; Stolzenbach, Heinrich; Wramba, Herbert; and Wulff, Walter, to Dr. Kurt Herberts & Co. Gesellschaft mit beschrankter Haftung Vorm. Otto Louis Herberts. Method for joining foils. 4,092,202, Cl. 156-331.000.
Berkoff, Charles E.; and Webb, Robert Lee, to SmithKline Corporation. 2,3-Dichloro-4-hydroxy-benzoic acid and process for preparation thereof. 4,092,352, Cl. 260-521.00H.
Berlad, Abraham L.; Salzano, Francis J.; and Batey, John E., to United States of America, Energy. Low heat transfer, high strength window materials. 4,091,592, Cl. 52-616.000.
Bernardo, Anthony J., to Raymond Lee Organization, Inc., The. Flower planter kit. 4,091,928, Cl. 206-575.000.
Berney, Jean-Claude. Apparatus for adjusting the output frequency of a frequency divider. 4,092,604, Cl. 328-48.000.
Berni, Ralph J.; Benerito, Ruth R.; and Pilkington, Mary W., to United States of America, Agriculture. Emulsion systems for imparting durable press properties to cotton and cotton-polyester blended textiles. 4,092,106, Cl. 8-115.700.
Bernstein, Donald J. Alteration-sensitive imprinted article. 4,092,449, Cl. 428-29.000.
Berry, Milton E., to Southwire Company. Wheel spreader and crack closer. 4,091,860, Cl. 164-433.000.
Berte, Marc: *See*—
Desormiere, Bernard; and Berte, Marc, 4,092,588, Cl. 324-56.000.
Bertea Corporation: *See*—
Beneker, Claus; and La Salle, Stanley G., 4,091,841, Cl. 138-89.000.
Bertin & Cie: *See*—
Mantoux, Gerard, 4,091,670, Cl. 73-302.000.
Bertrand, Jean-Noel Marie, to Labofina S. A. Fire retardant polystyrenic compositions. 4,092,281, Cl. 260-23.00H.
Berwick, Martin Alfred: *See*—
Wright, Hal Eldon; and Berwick, Martin Alfred, 4,092,162, Cl. 96-1.50N.
Betts, Robert E., to United States of America, Army. High rate propellant. 4,092,189, Cl. 149-19.200.
Beyer, Horst; and Buran, Ulrich, to Goetzewerke Friedrich Goetze AG. Spray powder for the manufacture of layers having high resistance to wear and burn traces. 4,092,158, Cl. 75-254.000.
Beyer, Otto, to Carl Hurth Maschinen- und Zahnradfabrik. Synchronizing device. 4,091,904, Cl. 192-107.00M.
Bhattacharya, Bhairab C. Thermal convection counter streaming sedimentation and forced convection galvanization method for controlling the sex of mammalian offspring. 4,092,229, Cl. 204-180.00R.
Bianchi, Estella: *See*—
Russo, Saverio; Bianchi, Estella; Ciferri, Alberto; Valenti, Barbara; and Bonta, Giorgio, 4,092,301, Cl. 260-78.00L.
Bianco, Ernest J., to Pfizer Inc. Novel crystalline forms of prazosin hydrochloride. 4,092,315, Cl. 544-291.000.
Bicking, John B.: *See*—
Cragoe, Edward J., Jr.; Bicking, John B.; and Smith, Robert L., 4,092,356, Cl. 260-535.00R.
Bieringer, Robert J.; and Mather, George R., Jr., to Owens-Illinois, Inc. Solar energy collection apparatus. 4,091,796, Cl. 126-270.000.
Bigarella, Federico. Control device for vial filling machines. 4,091,932, Cl. 209-82.000.
Bigelow, John Howard, to Du Pont de Nemours, E. I., and Company. Organophosphine chelates of platinum and palladium as sensitizers. 4,092,171, Cl. 96-108.000.
Bindernagel, Ali: *See*—
Kocks, Friedrich, deceased; and Kocks, Jutta, heir, 4,091,524, Cl. 29-527.700.
Biochemie Ges.m.b.H.: *See*—
Brandl, Ernst; Knauseder, Franz; and Rembold, Franz, 4,092,424, Cl. 424-299.000.
Biollaz, Michel; and Kalvoda, Jaroslav, to Ciba-Geigy Corporation. Difluorosteroids and processes for their manufacture. 4,092,310, Cl. 260-239.55D.
Bipol Ltd.: *See*—
Beitner, Shlomo, 4,092,138, Cl. 62-3.000.
Bird, Colin Leonard: *See*—
Barclay, Donald John; Bird, Colin Leonard; Hallett, Michael Henry; Kirkman, David Horrobin; Minshull, John Francis; and Owen, Charles Edward, 4,092,637, Cl. 340-324.00R.
Birlmeier, Josef, to Siemens Aktiengesellschaft. Switching arrangement for monitoring polarity reversal on lines in telecommunication systems. 4,092,489, Cl. 178-3.000.
Bjorklund, Christer James Axel; and Reuterhall, Alf Ragnar, to Kema-Nord AB. Mixtures having antimicrobial or pesticidal effect. 4,092,432, Cl. 424-326.000.
Blades, John D.: *See*—
Jackson, Jerome E.; and Blades, John D., 4,092,160, Cl. 96-1.00R.
Blessing, Hubert, to Levi Strauss & Co. Shademarker. 4,092,020, Cl. 270-31.000.
Block, Barry, to Diax. Force transducer having a linear transfer characteristic. 4,091,680, Cl. 73-517.00R.
Blocker, Truman G., III, to Texas Instruments Incorporated. High power field effect transistor. 4,092,660, Cl. 357-22.000.
Bobrowski, Miroslaw: *See*—
Gruszecki, Wojciech; Bordwski, Edward; Gumieniak, Jerzy; Gumieniak, Malgorzata; Smulkowski, Maciej; Wojciechowska, Hanna; and Bobrowski, Miroslaw, 4,092,335, Cl. 260-348.440.
Bochan, John, to General Electric Company. Laundry machine air vent. 4,091,546, Cl. 34-73.000.
Bochan, John, to General Electric Company. Turbine pump. 4,091,644, Cl. 68-18.00F.
Bochis, Richard J., to Merck & Co., Inc. Process for the preparation of imidazo [1,2-a] pyridines. 4,092,321, Cl. 260-294.80C.
Bocker, Ernst; Kracht, Wolfgang; Rupp, Roland; Schellmann, Erhard; Trescher, Viktor; and Ullrich, Martin, to Bayer Aktiengesellschaft. Apparatus for the preparation of melt-sprayed spherical phenacetin granules. 4,092,089, Cl. 425-10.000.
Bode, James Daniel: *See*—
Tsang, Peter Hing-Shya; Hradek, Richard W.; and Bode, James Daniel, 4,092,264, Cl. 252-186.000.
Bodine, Albert G.; and von Seggern, Ernest Alfred, to Bodine, Albert G. Centrifugal trap for solid particles. 4,091,988, Cl. 233-1.00R.
Bodor, Nicolae S.: *See*—
Kaminski, James J.; and Bodor, Nicolae S., 4,092,420, Cl. 424-263.000.
Boehlke, Klaus: *See*—
Wurmb, Rolf; Beck, Fritz; and Boehlke, Klaus, 4,092,463, Cl. 429-105.000.
Boehringer Mannheim GmbH: *See*—
Winter, Werner; Thiel, Max; Stach, Kurt, deceased; Roesch, Androniki; Plattner, Werner, administrator; and Schaumann, Wolfgang, 4,092,416, Cl. 424-250.000.
Boekkooi, Anton: *See*—
Zijlstra, Anthonie Louis; and Boekkooi, Anton, 4,091,951, Cl. 220-2.10R.
Boesen, George Francis; and Kay, Peter Lawrence, to Borg-Warner Corporation. Variable area capacitive pressure transducer with temperature compensation. 4,092,696, Cl. 361-283.000.
Bogri, Tibor: *See*—
Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, 4,092,427, Cl. 424-317.000.
Boise Cascade Corporation: *See*—
Thornhill, Dewey B., 4,091,718, Cl. 93-39.10R.
Bojas, Edward J.; and Ours, David C., to Eaton Corporation. Ring dampener for rotary fluid pressure device. 4,091,717, Cl. 91-498.000.
Boldebuck, Edith M., to General Electric Company. Polyamide acid salts. 4,092,300, Cl. 260-78.0UA.
Bolton, Edgar A.; and Olson, Gust A., to Jacquard Systems. Method and apparatus for embossing cards and sheets. 4,091,910, Cl. 400-131.000.
Bombelli, Nino; and Trutmann, Willy, to Spribag Aktiengesellschaft. Pneumatic feeder-dispenser for bulk material. 4,092,046, Cl. 302-49.000.
Bonnanzio, Richard Louis: *See*—
Bennett, Robert Gordon, Jr.; and Bonnanzio, Richard Louis, 4,092,048, Cl. 308-9.000.
Bonta, Giorgio: *See*—
Russo, Saverio; Bianchi, Estella; Ciferri, Alberto; Valenti, Barbara; and Bonta, Giorgio, 4,092,301, Cl. 260-78.00L.
Booth, Vernard S.; and Oswalt, Billy W., to Olinkraft, Inc. Bulk container with partial bellows bottom. 4,091,983, Cl. 229-15.000.
Borbely, Gyula John, to International Nickel Company, Inc., The. Volatilization of impurities from smelter reverts. 4,092,152, Cl. 75-7.000.

Borcherding, Ronald L.: *See*—
Bell, Frank H.; Borcherding, Ronald L.; Munson, William O.; McDonald, Michael S.; and Peterson, John A., 4,091,729, Cl. 102-38.000.
Bordwski, Edward: *See*—
Gruszecki, Wojciech; Bordwski, Edward; Gumieniak, Jerzy; Gumieniak, Malgorzata; Smulkowski, Maciej; Wojciechowska, Hanna; and Bobrowski, Miroslaw, 4,092,335, Cl. 260-348.440.
Borg-Warner Corporation: *See*—
Boesen, George Francis; and Kay, Peter Lawrence, 4,092,696, Cl. 361-283.000.
Mitch, George Charles, 4,091,638, Cl. 62-470.000.
Borowick, John Joseph; Gelernter, Boaz; Lipetz, Nathan; and Stern, Richard A., to United States of America, Army. Line source antenna for small angle electronic beam scanning. 4,092,647, Cl. 343-768.000.
Bottcher, Dieter, to Stahlecker, Fritz; and Stahlecker, Hans, 03 DT. Open end spinning frame with a magnetic switch for sliver feed. 4,091,606, Cl. 57-58.890.
Boubouleix, Albert, to Thomson-CSF. Transistorized class AB power amplifier and its bias circuit. 4,092,613, Cl. 330-289.000.
Boux, Rene; and Levaillant, Claude, to C.G.R. MeV. Device for checking the irradiation dose measuring circuits used to measure the irradiation doses delivered by a radiotherapy apparatus. 4,092,538, Cl. 250-336.000.
Bovenlander, Johannes P., to Sun Electric Corporation. Apparatus for measuring engine timing independent of speed. 4,092,585, Cl. 324-16.00T.
Bower, Richard R. Ornamental replaceable letter displaying device. 4,091,554, Cl. 40-623.000.
Bowman, Robert Mathews, to Ciba-Geigy Corporation. 1,4-Oxazepines. 4,092,330, Cl. 260-333.000.
Bowser, George H., to PPG Industries, Inc. In situ curable sealant and methods for making and using same. 4,092,290, Cl. 260-42.360.
Brabits, William C.: *See*—
Snyder, David E.; Locke, Joe B.; and Brabits, William C., 4,091,832, Cl. 137-72.000.
Bradley, Charles Duane, Jr., to Pneumo Corporation. Anti-rotation lock for threaded connection. 4,092,080, Cl. 403-319.000.
Bradshaw, Janice: *See*—
Cook, Martin Christopher; Gregory, Gordon Ian; and Bradshaw, Janice, 4,092,477, Cl. 544-26.000.
Brambilla, Giovanni; and Caporali, Giacomo, to Agip Nucleare, S.p.A. Pyrochemical separation of plutonium from irradiated nuclear fuels, by thermal decomposition in molten nitrates. 4,092,397, Cl. 423-5.000.
Brand, Derek A.: *See*—
Barlow, Gordon A.; Brand, Derek A.; and Imatt, Alex, 4,091,995, Cl. 238-10.00A.
Brandl, Ernst; Knauseder, Franz; and Rembold, Franz, to Biochemie Ges.m.b.H. Antibiotic derivatives. 4,092,424, Cl. 424-299.000.
Brasnett, Keith Ashley, to Rolls-Royce (1971) Limited. Apparatus for measuring spatial data from recorded images. 4,092,669, Cl. 358-107.000.
Braus, Harry; and Woltermann, Jay R., to National Distillers and Chemical Corp. Flame retardant compositions. 4,092,292, Cl. 260-45.75B.
Brefka, Paul E., to Analog Devices, Incorporated. Protective case for electrical instruments on circuit boards. 4,092,698, Cl. 361-399.000.
Brennan, Vishno Edward: *See*—
Majkrzak, Charles Peter; and Brennan, Vishno Edward, 4,092,484, Cl. 174-12.00R.
Brennenstuhl, Hugo. Apparatus for uniformly coating objects with particles. 4,091,764, Cl. 118-621.000.
Brenner, Gunter: *See*—
Credner, Karl; Goring, Joachim; Brenner, Gunter; and Tauscher, Manfred, 4,092,417, Cl. 424-253.000.
Breuer, Hermann; and Treuner, Uwe D., to E. R. Squibb & Sons, Inc. Trifluoroalkylureido 3-heterocyclic thio methyl cephalosporins. 4,092,475, Cl. 544-21.000.
Breville Holdings Pty. Ltd.: *See*—
Wheeler, Richard George, 4,091,720, Cl. 99-375.000.
Brice, John Chadwick; and Robertson, John Mackay, to U.S. Philips Corporation. Method of growing single crystals of rare earth metal iron garnet materials. 4,092,208, Cl. 156-624.000.
Bridger, Robert F.; and Schmitt, Kirk D., to Mobil Oil Corporation. Process of preparing monoaryl phosphonates and lubricant compositions containing same. 4,092,254, Cl. 252-49.800.
Bridwell, Billy W.; and Johnson, Carl E., to Nalco Chemical Co. Alkylation of phenols. 4,092,367, Cl. 568-785.000.
Bro, Per: *See*—
Dey, Arabinda N.; and Bro, Per, 4,092,464, Cl. 429-127.000.
Brooks, Philip Lee, to Raychem Corporation. Method for joining substrates utilizing coupling means. 4,092,193, Cl. 156-83.000.
Brooks, Teddar S.: *See*—
Zimbardi, Dominic J., 4,092,136, Cl. 55-212.000.
Brose, Werner: *See*—
Buchner, Norbert; and Brose, Werner, 4,091,930, Cl. 206-605.000.
Browder, Lewis B., to Bell & Howell Company. Methods and apparatus for precision guiding a web. 4,091,979, Cl. 226-7.000.
Brown, Ralph E. Small building structure. 4,091,584, Cl. 52-86.000.
Brown, Richard E., to Warner-Lambert Company. Process for the preparation of indolothiopyrones and indolylthio acid intermediates used in their preparation. 4,092,328, Cl. 260-326.5SA.
Brown & Root, Inc.: *See*—
Harris, Robert S., 4,092,038, Cl. 294-78.00R.
Brown, Vaikai K.; and Fatur, Richard N., to Towmotor Corporation. Creeper - deadman. 4,091,889, Cl. 180-101.000.
Brown & Williamson Tobacco Corporation: *See*—
Psaras, John D., 4,091,824, Cl. 131-135.000.
Brownlee, Robert R.; and Tyers, G. Frank O., to Research Corporation. Cardiac pacing apparatus with electromagnetic interference protection. 4,091,818, Cl. 128-419.0PG.
Buchner, Norbert; and Brose, Werner, to Robert Bosch GmbH. Container. 4,091,930, Cl. 206-605.000.
Buck, Francis Fremonte, to Fisher Scientific Company. Indirect latex test for determination of immunoglobulins. 4,092,114, Cl. 23-230.00B.
Bucking, Hans-Walter: *See*—
Cuntze, Ulrich; May, Adolf; and Bucking, Hans-Walter, 4,092,253, Cl. 252-8.800.
Buckley, Janette A.: *See*—
French, John Barry; Reid, Neil M.; and Buckley, Janette A., 4,091,655, Cl. 73-23.000.
Budd Company, The: *See*—
D'Orazio, Peter J., 4,092,051, Cl. 298-24.000.
Buhl, Peter. Screw-locking device. 4,091,853, Cl. 151-35.000.
Buhler, Arthur: *See*—
Schutz, Hans Ulrich; and Buhler, Arthur, 4,092,307, Cl. 260-146.00R.
Bulten Kanthal Aktiebolag: *See*—
Eriksson, Hans Edvin Ake; Kaberg, Bengt Sune; and Rehnovist, Nils Torsten, 4,092,224, Cl. 204-32.00R.
Bumgardner, Jon H., to United States of America, Navy. Ultra high input impedance/voltage range amplifier. 4,092,701, Cl. 330-297.000.
Bunger, Heinrich, to Dynamit Nobel Aktiengesellschaft. Process for the recovery of dimethyl terephthalate and of intermediates from the dimethyl terephthalate manufacture. 4,092,481, Cl. 560-77.000.
Bunker Ramo Corporation: *See*—
Nijman, John Peter; and Patterson, Terence Neil, 4,091,530, Cl. 29-749.000.
Buran, Ulrich: *See*—
Beyer, Horst; and Buran, Ulrich, 4,092,158, Cl. 75-254.000.
Burckhardt, Urs: *See*—
Schmid, Wolfgang; Basler, Walter; and Burckhardt, Urs, 4,092,415, Cl. 424-250.000.
Burge, Anthony George: *See*—
Sanderson, Gordon Francis; and Burge, Anthony George, 4,091,597, Cl. 53-59.00R.
Burkett, Bobby G.; and Henry, Raymond W., to Texas Instruments Incorporated. Data processor with read-only-memory processor and partial solution push-down stack. 4,092,730, Cl. 364-900.000.
Burleigh, John E.: *See*—
Uraneck, Carl A.; Burleigh, John E.; and Marrs, Oren L., 4,092,465, Cl. 526-1.000.
Burmeister, Dennis N.; and Yourich, Adolph J., to Outboard Marine Corporation. Starter mechanism with overspin restrictor shoe. 4,091,788, Cl. 123-185.0BA.
Burnham, Daniel Arthur: *See*—
Zbranek, Vladimir; Zbranek, Zdenka; and Burnham, Daniel Arthur, 4,092,400, Cl. 423-54.000.
Burroughs Corporation: *See*—
Walton, Tommy L., 4,092,057, Cl. 339-17.00F.
Burrows, Brian: *See*—
Giess, Herbert; Burrows, Brian; and Janssoone, Marie-Michelle, 4,092,462, Cl. 429-50.000.
Burton, Ralph M., to USM Corporation. Method for welding through paint. 4,092,514, Cl. 219-99.000.
Bushey, Robert D.; and McCole, Thomas P., to Polaroid Corporation. Photographic film unit with taps on binding element. 4,092,167, Cl. 96-76.00C.
Bushnell, Rayburn: *See*—
Gunn, Charles R.; and Bushnell, Rayburn, 4,091,629, Cl. 61-72.400.
Butsch, Otto R., to Sycor, Inc. Disc file assembly. 4,092,687, Cl. 360-102.000.
Button, Martha Willis, executrix: *See*—
Button, Robert L., deceased; and Turkovich, Antone J., 4,091,931, Cl. 209-73.000.
Button, Robert L.: *See*—
Button, Robert L., deceased; and Turkovich, Antone J., 4,091,931, Cl. 209-73.000.
Button, Robert L., deceased (by Button, Martha Willis, executrix); and Turkovich, Antone J., to Button, Robert L. Fruit sorting method and apparatus. 4,091,931, Cl. 209-73.000.
Byrne, Geoffrey Arthur, to Inveresk Research International. Device and method for monitoring the metal content of aqueous systems. 4,092,117, Cl. 23-230.00R.
C.G.R. MeV: *See*—
Boux, Rene; and Levaillant, Claude, 4,092,538, Cl. 250-336.000.
Cailey, Ronald J., to Glass Master Sales and Leasing Corporation. Scrap stripper and chopper with conveyor. 4,091,697, Cl. 83-5.000.
Calkins, James Stewart; and Nilsen, Alfred, to Dow Chemical Company, The. Soil fumigant kit. 4,092,112, Cl. 21-108.000.
Calkins, Thornton Ross; and Jaquiss, Donald Benjamin George, to General Electric Company. Stabilized polycarbonate resin. 4,092,288, Cl. 260-37.0PC.
Callan, John E., to Cities Service Company. Hot melt sealant composition. 4,092,282, Cl. 260-26.000.
Calspan Corporation: *See*—
Baier, Robert E.; and DePalma, Vito A., 4,092,119, Cl. 23-253.0TP.
Calvert, Rodney K., to Mead Corporation, The. Apparatus for setting up and loading a tray. 4,091,937, Cl. 214-1.0BB.
Camerik, Eduard, to U.S. Philips Corporation. Video player having plural safety devices actuated by unlatching. 4,092,671, Cl. 358-128.000.

Campbell, John H., to General Electric Company. Fluorescent lamp unit for multiple installation. 4,092,562, Cl. 315-189.000.
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Malcolm, Richard, 4,091,482, Cl. 5-343.000.
Canadian General Electric Co., Ltd.: *See—*
Robins, William Harold, 4,092,607, Cl. 330-8.000.
Canon Kabushiki Kaisha: *See—*
Ito, Tadashi; Ito, Fumio; Mashimo, Yukio; Sakurado, Nobuaki; and Shinoda, Nobuhiko, 4,092,652, Cl. 354-23.00D.
Canton Textile Mills, Inc.: *See—*
Sullins, John K., 4,092,105, Cl. 8-81.000.
Capdevielle, Pierre; and Kermarrec, Francois, to Institut Francais du Petrole des Carburants et Lubrifiants and Societe Anonyme Pour Tous. Tank structure for the storage and distribution of several fluids, particularly hydrocarbons. 4,091,952, Cl. 220-22.000.
Caporali, Giacomo: *See—*
Brambilla, Giovanni; and Caporali, Giacomo, 4,092,397, Cl. 423-5.000.
Capritta, Angelo T.: *See—*
Bates, David A.; and Capritta, Angelo T., 4,091,811, Cl. 128-214.400.
Carberry, John Leonard, to Chemetron Corporation. Method of constructing a double-sigmoid connector. 4,091,982, Cl. 228-173.00F.
Carey, Robert, to U.S. Philips Corporation. Multi-tool machine provided with a numerical control system. 4,092,720, Cl. 364-474.000.
Carl Hurth Maschinen- und Zahnradfabrik: *See—*
Beyer, Otto, 4,091,904, Cl. 192-107.00M.
Seitz, Max, 4,091,686, Cl. 74-409.000.
Carl Zeiss Stiftung: *See—*
Lang, Rudolf; and Schwarz, Gerhard, 4,092,656, Cl. 354-202.000.
Carlson, William L., Jr., to General Signal Corporation. Variable fluid passage. 4,092,010, Cl. 251-4.000.
Carnation Company: *See—*
Tonner, George F., 4,092,438, Cl. 426-601.000.
Carre, Jean-Jacques; and Muterel, Roland, to Societe Anonyme D.B.A. Servomotor. 4,091,619, Cl. 60-553.000.
Carson Manufacturing Company: *See—*
Smith, Gerald D.; and Owens, Frank R., 4,092,692, Cl. 361-94.000.
Carter, Lee T. Golf practice device. 4,092,027, Cl. 273-195.00R.
Castelli, Joseph Tom; and Forrester, Joseph J., to Instrument Services, Inc. Ball throwing machine. 4,091,791, Cl. 124-73.000.
Caterpillar Tractor Co.: *See—*
Durgan, Virgil R. C., 4,091,519, Cl. 29-427.000.
Harper, Robert W.; and Shelby, Robert L., 4,092,074, Cl. 403-24.000.
Montgomery, Alvin W., 4,091,785, Cl. 123-140.00R.
Caviar, Lee. Timer arrangement. 4,092,505, Cl. 200-38.00D.
Caw Industries, Inc.: *See—*
Willard, John Wesley, Sr., 4,092,145, Cl. 71-68.000.
Cebalo, Tony, to Air Products and Chemicals, Inc. Amide derivatives of 1,3,4-thiadiazoles. 4,092,148, Cl. 71-90.000.
Celli, Charles. Process for the preparation of 2-n-pentyl-3-(2-oxopropyl)-1-cyclopentanone. 4,092,362, Cl. 260-586.00R.
Center, Robert E.: *See—*
von Rosenberg, Charles W., Jr.; Ewing, James J.; Center, Robert E.; and Chen, Hao-Lin, 4,092,405, Cl. 423-580.000.
Cerny, Jacqueline; and Vivant, Gilbert, to Rhone-Poulenc Industries. Compositions intended for the flameproofing of plastics. 4,092,460, Cl. 428-407.000.
Cerutti, Richard L.; Henry, Vincent I.; and Sensi, John E., to PPG Industries, Inc. Apparatus and method using heat pipes for manipulating temperature gradients in a glass forming chamber. 4,092,140, Cl. 65-99.00A.
Chambers, Derek; and Masterman, Hugh C., to Raytheon Company. Switched high voltage power supply system. 4,092,566, Cl. 315-375.000.
Chambley, Phillip Wayne; Norris, Alan Hedley; Frazier, Robert Doyal; and Cromer, Dwain Edwin, to Champion International Corporation. Deweaving apparatus for textile tapes. 4,091,512, Cl. 28-171.000.
Champion International Corporation: *See—*
Chambley, Phillip Wayne; Norris, Alan Hedley; Frazier, Robert Doyal; and Cromer, Dwain Edwin, 4,091,512, Cl. 28-171.000.
Chang, Louis H.; Fravel, John C.; Herendeen, Carl E.; and Ruble, Frank D., to Xerox Corporation. Control apparatus for serial printer. 4,091,911, Cl. 400-70.000.
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Charles Stark Draper Laboratory, Inc., The: *See—*
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Chase, Charles Edgar, to Trecan Ltd. Waste incinerator system. 4,091,747, Cl. 110-210.000.
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Chemetron Corporation: *See—*
Carberry, John Leonard, 4,091,982, Cl. 228-173.00F.
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Chronberg, Sten, to Agence Nationale de Valorisation de la Recherche (ANVAR). Method of preparing by electrophoresis a shaped article constituted by agglomerated particles and a device for carrying out the said method. 4,092,231, Cl. 204-181.00F.
Chugai Seiyaku Kabushiki Kaisha: *See—*
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Fischer, Hanspeter; and Bellus, Daniel, 4,092,146, Cl. 71-70.000.
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Claasen, Antonius Bernardus. Machine for packaging dispensing spoons and method. 4,091,915, Cl. 198-389.000.
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Clark, Madalin M., to Raymond Lee Organization, Inc., The, a part interest. Vibrating back scratcher. 4,091,805, Cl. 128-41.000.
Clarke, David E.; and Richards, Lawrence I., to Advance Lifts, Incorporated. Collapsible safety guard for platform lift. 4,091,906, Cl. 192-129.00A.
Clarke, Ray Allen, to Du Pont de Nemours, E. I., and Company. Process for making yellow, basic azomethine dyes. 4,092,104, Cl. 8-41.00R.
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Clemens, James D.; and Williams, Elmer A., to Rockwell International Corporation. Fluid actuated timing mechanism. 4,091,776, Cl. 123-90.150.
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Coates, George R., to Schlumberger Technology Corporation. Apparatus and method for determination of subsurface porosity utilizing microwave electromagnetic energy. 4,092,583, Cl. 324-6.000.
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Coll-Palagos, Miguel, to Stauffer Chemical Company. Method of plating metals. 4,092,448, Cl. 427-383.00D.
Colliard, Lynette K., deceased. Pet collar. 4,091,766, Cl. 119-106.000.
Collins, Dean R.; and Norvell, Bill R., to Texas Instruments Incorporated. Analogue memory. 4,092,734, Cl. 365-238.000.
Collins, Michael Alfred, to Covpak International Limited. Combined carton and supporting pallet. 4,091,923, Cl. 206-386.000.
Colome, Jacques; Duchene, Alain; and Regnier, Jean, to Commissariat a l'Energie Atomique. Device for extinguishing a liquid-fuel fire by isolation. 4,091,875, Cl. 169-49.000.
Columbia Ribbon & Carbon Mfg. Co., Inc.: *See*—
Newman, Douglas A.; and Schlotzhauer, Allan T., 4,092,456, Cl. 428-307.000.
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Chaze, Gilbert; Cherel, Guy; Guilloteau, Rene; and Tucoulat, Daniel, 4,091,699, Cl. 83-56.000.
Colome, Jacques; Duchene, Alain; and Regnier, Jean, 4,091,875, Cl. 169-49.000.
Dussaussoy, Pierre; Mongin, Pierre; Rouviere, Rene; and Simon, Gilbert, 4,092,135, Cl. 55-158.000.
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Weit, James G., 4,092,579, Cl. 318-662.000.
Cook, Martin Christopher; Gregory, Gordon Ian; and Bradshaw, Janice, to Glaxo Laboratories Limited. 7β-[2-Etherified oximino-2-(phenyl- or naphthylacetamido)] cephalosporins. 4,092,477, Cl. 544-26.000.
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Cordani, Eugene J. Stacked container well hole gondola car. 4,091,742, Cl. 105-366.00D.
Cornell, Charles R., to Eaton Corporation. Hydraulic controller. 4,091,617, Cl. 60-445.000.
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Cortner, William C., Jr.; and Daniels, Rogers C., to Philips Roxane, Inc. Partially transparent eyeshield. 4,091,809, Cl. 128-163.000.
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Costantini, Michel; Dromard, Adrien; and Jouffret, Michel, to Rhone-Poulenc Industries. Process for the preparation of 3,5,5-trimethylcyclohex-2-ene-1,4-dione. 4,092,361, Cl. 260-586.00P.
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Cragoe, Edward J., Jr.; Bicking, John B.; and Smith, Robert L., to Merck & Co., Inc. 11,12-Secoprostaglandins. 4,092,356, Cl. 260-535.00R.
Cragoe, Edward J., Jr.; Schultz, Everett M.; and Stokker, Gerald E., to Merck & Co., Inc. 3,4-Dihydrospiro-2H-1,3-benzoxazines and their use in treating edema, abnormal electrolyte retention, and inflammation. 4,092,414, Cl. 424-248.510.
Craven, Daniel R., to Pennsylvania Pacific Corporation. Hinged bin. 4,091,950, Cl. 217-47.000.
Cravens, Harold, to H. Fishlove & Co. Container for holding four glasses in spaced relation and blank for forming same. 4,091,926, Cl. 206-426.000.
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Crosby, Robert J., to Horizons Incorporated a division of Horizons Research Incorporated. Reflectance probe. 4,092,164, Cl. 96-27.00R.
Crothers, Harry; and Lockley, Sidney R., to Crothers, Harry. Drapery pleater steamer. 4,091,973, Cl. 223-28.000.
Crovetti, Aldo Joseph, to Abbott Laboratories. Quinone derivatives as molluscicides. 4,092,433, Cl. 424-331.000.
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Octasodium-1,1,2,2,4,4,5,5-cyclohexane octacarboxylate and compositions and methods employing same. 4,092,348, Cl. 260-514.00K.
Cuntze, Ulrich; May, Adolf; and Bucking, Hans-Walter, to Hoechst Aktiengesellschaft. Fabric softeners. 4,092,253, Cl. 252-8.800.
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Curatolo, Frank. Combination door lock and electrical switch. 4,091,866, Cl. 165-138.000.
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Curran, Adrian Charles Ward, to John Wyeth & Brother Limited. Certain 1-(N-acyl)-carbothioamides of 1,5-naphthyridine derivatives. 4,092,320, Cl. 260-294.80C.
Curran, Adrian Charles Ward, to John Wyeth & Brother Limited. Certain 1-carbothioamides of 1,5-naphthyridine derivatives. 4,092,418, Cl. 424-256.000.
Curtil, Remi, to Motosacoche S.A. Two-stroke internal combustion engine. 4,091,775, Cl. 123-59.0BM.
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Daboub, Henry A.; Henderson, Charles R.; and Balthrop, Chris A., to E-Systems, Inc. Code reading apparatus. 4,092,525, Cl. 235-463.000.
Daenen, Robert H. C. M., to Dart Industries Inc. Multi-purpose bowl set. 4,091,953, Cl. 220-23.860.
Daher, Reinhard L.; and Tucker, Frederick Robert. Prosthetic foot. 4,091,472, Cl. 3-7.000.
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Huffman, Roger B., 4,091,689, Cl. 74-785.000.
Daniel Valve Company: *See—*
Grove, Marvin H.; and Dunegan, Ronald G., 4,091,840, Cl. 137-561.00R.
Daniels, Peter J. L.; and Nafissi Varchei, Mohammad Mehdi, to Schering Corporation. Process for the preparation of 2,5-dideoxystreptamine and of a novel intermediate therefor. 4,092,359, Cl. 260-563.00R.
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Dardick, David. Gas generating charge for open chamber gas powered tool. 4,091,730, Cl. 102-39.000.
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Da Silva, Wilson Marcelo, to Cooperativa Central dos Produtores de Acucar e Alcool do Estado de Sao Paulo. Process for the obtaining of sound sugar cane gemmas for the control of the blight of sugar cane stumps left after cutting as well as the gemmas obtained by same process. 4,091,569, Cl. 47-58.000.
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Daughton, James M., to Honeywell Inc. Sensistor apparatus. 4,092,662, Cl. 357-28.000.
Davidson, Jacob. Head protector for use with hard head gear. 4,091,469, Cl. 2-410.000.
Davis, John M., Jr., to Hughes Aircraft Company. Carrier for mounting a semiconductor chip. 4,092,664, Cl. 357-80.000.
Davis, Thomas Francis, to AMP Incorporated. High efficiency palladium electroplating process, bath and composition therefor. 4,092,225, Cl. 204-47.000.
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DeBurgh, Ray. Portable male urinal. 4,091,476, Cl. 4-144.300.
Deffeyes, Robert J.; and Johnson, Grover Lee, to Graham Magnetics Incorporated. Powder products. 4,092,459, Cl. 428-403.000.
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Demazeau, Gerard; Maestro, Patrick; Plante, Theophile; Pouchard, Michel; and Hagenmuller, Paul, to Agence Nationale de Valorisation de la Recherche (ANVAR). Process for obtaining chromium dioxide CrO_2. 4,092,439, Cl. 423-607.000.
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D'Entremont, John R., to Texas Instruments Incorporated. Motor starting and protecting apparatus. 4,092,573, Cl. 318-221.00C.
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Depka, Charles W. Cement block wall. 4,091,587, Cl. 52-421.000.
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Desormiere, Bernard; and Berte, Marc, to Thomson-CSF. Method of monitoring the machining by ion bombardment of a piezoelectric wafer. 4,092,588, Cl. 324-56.000.
DeSoto, Inc.: *See—*
McLaughlin, Robert L.; and Wood, Donald C., 4,092,258, Cl. 252-99.000.
Desrosiers, Wilfrid; and Landry, Jean-Marc. Vacuum cleaner nozzle. 4,091,496, Cl. 15-371.000.
DeStafeno, Geraldine Z.: *See—*
Cosmi, Vincent, 4,091,721, Cl. 99-453.000.
Dethlefs, David H. Hooksetter. 4,091,558, Cl. 43-15.000.
Deutsche Texaco Aktiengesellschaft: *See—*
Humbert, Heiko; Fuchs, Gundolf; and Pirck, Dietrich, 4,092,298, Cl. 260-75.00T.
De Volpi, Alexander, to United States of America, Energy. High-resolution radiography by means of a hodoscope. 4,092,542, Cl. 250-392.000.
Dewaele, Silvain Achiel Raoul, to s.a. Texaco Belgium n.v. Preparation of ketone acetals. 4,092,331, Cl. 260-340.50R.
Dey, Arabinda N.; and Bro, Per, to P. R. Mallory & Co. Inc. Flexible cells and batteries formed therefrom. 4,092,464, Cl. 429-127.000.
de Zarauz, Yves, to Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie. Catalytic composition. 4,092,268, Cl. 252-430.000.
Diamond Shamrock Corporation: *See—*
Harris, Richard L.; and Goble, Paul H., 4,092,293, Cl. 260-47.0EC.
Diax: *See—*
Block, Barry, 4,091,680, Cl. 73-517.00R.
Diaz, Jose A. Vehicular auxiliary braking system. 4,091,898, Cl. 192-3.00M.
Dichter, Hans-Joachim. Machine for making containers from glass tubes. 4,092,142, Cl. 65-159.000.
DiCiaccio, James J., to Itek Corporation. Linear measuring apparatus. 4,091,541, Cl. 33-125.00R.
Dickerson, Samuel C. Diabetic diary. 4,091,552, Cl. 40-518.000.
Dickinson, Ben Wade Oakes, III; and Dickinson, Robert Wayne. Intravaginal device and method of use. 4,091,807, Cl. 128-130.000.
Dickinson, Robert V. C.; Entenman, Alan W.; and Kliphuis, Jans. Data transmission and reception system. 4,092,596, Cl. 325-49.000.
Dickinson, Robert Wayne: *See—*
Dickinson, Ben Wade Oakes, III; and Dickinson, Robert Wayne, 4,091,807, Cl. 128-130.000.
Dictaphone Corporation: *See—*
Sander, Willy M., 4,092,679, Cl. 360-71.000.
Sander, Willy M., 4,092,680, Cl. 360-72.000.
Sander, Willy M.; and Debaudringhien, Andre T., 4,092,685, Cl. 360-92.000.
Zetter, Mark S., 4,092,232, Cl. 204-195.00P.
Dieck, Ronald L.; Goldfarb, Louis; and Hann, Nancy D., to Armstrong Cork Company. Molecular-weight modification of polyphosphazenes. 4,092,278, Cl. 260-2.50R.
DIEHL, Firma: *See—*
Kratz, Bernhard; and Potthof, Erwin, 4,091,608, Cl. 58-22.900.
Meisner, Alfred; Arnold, Werner; and Ennen, Peter, 4,091,612, Cl. 58-85.500.

Dietrich, Werner: *See*—
Reischl, Artur; Jabs, Gert; Dietrich, Werner; and Gonzalez-Dorner, Alberto Carlos, 4,092,275, Cl. 260-2.5BD.
Dietz, George, Jr.; and Skomoroski, Robert M., to American Chemical & Refining Co., Inc. Aluminum containing precipitating agent for precious metals and method for its use. 4,092,154, Cl. 75-109.000.
Difflipp, Kurt: *See*—
Preuss, Friedrich; and Difflipp, Kurt, 4,092,022, Cl. 271-236.000.
Dillmann, Gerhard, to Hoechst Aktiengesellschaft. Process for fixing prints with reactive dyestuffs on textile materials of native or regenerated cellulose and mixtures thereof with synthetic fibers. 4,092,101, Cl. 8-1.00E.
Dimitriadis, George: *See*—
Alwood, Gloria Belle; and Dimitriadis, George, 4,092,195, Cl. 156-94.000.
Dinkler, Leonard R.; and Herrin, Jerry, to General Electric Company. Temperature-sensing circuit. 4,092,586, Cl. 324-28.0RS.
Di Nunzio, Vittorio, to FIAT Societa per Azioni. Method and apparatus for stabilizing the through flow of electromagnetic injectors. 4,092,717, Cl. 364-431.000.
Diversified Chemical Corporation: *See*—
Kozlowski, Eugene C.; and Stout, Charles A., 4,091,868, Cl. 166-250.000.
Dix, Gary Lee; Hanson, Charles Christian; Jahnke, Robin Charles; and King, Francis Kong, to International Business Machines Corporation. Flexible disk file access mechanism. 4,092,681, Cl. 360-75.000.
Dixon, Bernard, to Dixon International Limited. Manufacture of draught excluders. 4,092,394, Cl. 264-210.00R.
Dixon International Limited: *See*—
Dixon, Bernard, 4,092,394, Cl. 264-210.00R.
Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See*—
Dorsch, Heinz, 4,091,620, Cl. 60-606.000.
Dr. Ing. Rudolf Hell GmbH: *See*—
Knop, Hans-Georg, 4,092,668, Cl. 358-80.000.
Dr. Kurt Herberts & Co. Gesellschaft mit beschrankter Haftung Vorm. Otto Louis Herberts: *See*—
Bergk, Berndt; Lilienbeck, Klemens; Ottmann, Gerhard Friedrich; Stolzenbach, Heinrich; Wramba, Herbert; and Wulff, Walter, 4,092,202, Cl. 156-331.000.
Dohet, Pierre E. Collapsible structure. 4,091,485, Cl. 9-2.00C.
Dolphin Showers (Patent) Limited: *See*—
Lewis, Robert; and Lewis, Jack, 4,091,477, Cl. 4-146.000.
Domoto, Masahiro; and Tsuji, Kozo, to Sumitomo Chemical Company, Limited; and Hayashibara Biochemical Laboratories, Inc. Novel nonwoven fabric and method for manufacturing same. 4,092,454, Cl. 428-288.000.
Dompas, John M.; and Petry, Charles J., to Metallurgie Hoboken-Overpelt. Machines for the casting of metals. 4,092,155, Cl. 75-124.000.
Domtar Inc.: *See*—
Job, Allen R., 4,092,406, Cl. 423-594.000.
Lucas, John Martin; and Gracovetsky, Serge, 4,092,068, Cl. 356-73.000.
Donnelly, James Michael, to GTE Automatic Electric Laboratories Incorporated. Phase delay simulator. 4,092,605, Cl. 328-152.000.
Donner, Verne P., to Deltrol Corp. Ball check valve. 4,091,839, Cl. 137-533.130.
Dooley, Martin F.: *See*—
Ryer, Jack; and Dooley, Martin F., 4,092,127, Cl. 44-63.000.
Doom, Lewis G. Continuous mixer. 4,092,738, Cl. 366-304.000.
D'Orazio, Peter J., to Budd Company, The. Multi-purpose freight vehicle. 4,092,051, Cl. 298-24.000.
Dore, James E.: *See*—
Yarwood, John C.; Dore, James E.; and Preuss, Robert K., 4,092,153, Cl. 75-68.00R.
Dorsch, Heinz, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Supercharged internal combustion engine. 4,091,620, Cl. 60-606.000.
Dotson, Anderson O., Jr.: *See*—
Wolford, Lionel T.; Lee, Chien Yung; and Dotson, Anderson O., Jr., 4,092,345, Cl. 260-501.160.
Douek, Maurice; Schmidt, Gustav A.; Malofsky, Bernard M.; and Hauser, Martin, to Avery Products Corporation; and Loctite Corporation, a part interest to each. Anaerobic pressure sensitive adhesive composition. 4,092,374, Cl. 260-873.000.
Douek, Maurice; Schmidt, Gustav A.; Malofsky, Bernard M.; and Hauser, Martin, to Avery Products Corporation; and Loctite Corporation. Anaerobic pressure sensitive adhesive composition. 4,092,376, Cl. 260-884.000.
Dow Chemical Company, The: *See*—
Calkins, James Stewart; and Nilsen, Alfred, 4,092,112, Cl. 21-108.000.
Greenawalt, Eddie L.; and Whitaker, Charles M., 4,091,842, Cl. 138-90.000.
Kroposki, Lorraine M.; and Yoshimine, Masao, 4,092,312, Cl. 544-243.000.
Smith, William E., 4,092,364, Cl. 260-612.00R.
Stevens, Violete L.; Sexton, Arthur R.; and Corson, Frederick P., 4,092,339, Cl. 260-410.600.
Wade, Lisby Lucius; and McDermott, Muriel, 4,092,421, Cl. 424-266.000.
Dowty, George Herbert, deceased (by Dowty, Marguerite Anne Gowans, personal representative); by Lilley, Virginia Anne, personal representative; by Barber, Lionel, personal representative; and by Kneale, Peter James, personal representative, to Dowty Mining Equipment Limited. Pressure relief valve. 4,091,838, Cl. 137-528.000.
Dowty, Marguerite Anne Gowans, personal representative: *See*—
Dowty, George Herbert, deceased; Lilley, Virginia Anne, personal representative; Barber, Lionel, personal representative; and Kneale, Peter James, personal representative, 4,091,838, Cl. 137-528.000.
Dowty Mining Equipment Limited: *See*—
Dowty, George Herbert, deceased; Lilley, Virginia Anne, personal representative; Barber, Lionel, personal representative; and Kneale, Peter James, personal representative, 4,091,838, Cl. 137-528.000.
Dresser, Henry S.: *See*—
United States of America, National Aeronautics and Space Administration; Dresser, Henry S.; and Daileda, Joseph J., 4,091,665, Cl. 73-147.000.
Dreulle, Noel, to Compagnie Royale Asturienne des Mines. Process for reutilization of iron chlorides in aqueous solution. 4,092,401, Cl. 423-166.000.
Dri, Alfredo Felix; and Miranda, Jorge Cesar. Planting machine. 4,091,751, Cl. 111-2.000.
Driller, Jack; Porter, David; and Henriksen, William. Pacemaker training aid. 4,091,549, Cl. 35-17.000.
Dromard, Adrien: *See*—
Costantini, Michel; Dromard, Adrien; and Jouffret, Michel, 4,092,361, Cl. 260-586.00P.
Drossel, Rolf: *See*—
Schabert, Hans-Peter; and Drossel, Rolf, 4,092,490, Cl. 176-38.000.
DuBois, Robert A.; and Wagers, Rex E., to Greif Bros. Corporation. Chime protective gasket. 4,091,961, Cl. 220-319.000.
Duchene, Alain: *See*—
Colome, Jacques; Duchene, Alain; and Regnier, Jean, 4,091,875, Cl. 169-49.000.
Dunbeker, George H., to Rheem Manufacturing Company. Method for making a plastic container having a port adjacent the container periphery. 4,092,392, Cl. 264-98.000.
Dunegan, Ronald G.: *See*—
Grove, Marvin H.; and Dunegan, Ronald G., 4,091,840, Cl. 137-561.00R.
Dunhill, Geoffrey; and Halstead, Edgar R., to International Harvester Company. Window wiper assemblies for vehicles. 4,091,494, Cl. 15-250.160.
Dunlop Holdings Limited: *See*—
French, Tom; Edwards, Reginald Harold; and Powell, Leslie Vernon, 4,091,854, Cl. 152-158.000.
Dunlop Limited: *See*—
Jackson, William Lewis, 4,091,856, Cl. 152-361.00R.
Dunnam, Barnabas. Fuel preheating apparatus. 4,091,782, Cl. 123-122.00E.
Du Pont de Nemours, E. I., and Company: *See*—
Bigelow, John Howard, 4,092,171, Cl. 96-108.000.
Clarke, Ray Allen, 4,092,104, Cl. 8-41.00R.
Eigenbrode, George Thomas, 4,092,058, Cl. 339-218.00M.
Green, James R., 4,092,194, Cl. 156-89.000.
Hoffman, Frank Edward, 4,092,458, Cl. 428-402.000.
Ross, Francis Joseph, 4,092,228, Cl. 204-68.000.
Dura Plastics of New York, Inc.: *See*—
Korzon, Edward S., 4,091,555, Cl. 40-152.100.
Durand, Pierre, to Compagnie Generale des Etablissements Michelin. Electrochemical generators with a sedimentation bed. 4,092,461, Cl. 429-15.000.
Duranleau, Roger G., to Texaco Inc. Preparation of isoxazolines. 4,092,327, Cl. 260-307.0DA.
Durgan, Virgil R. C., to Caterpillar Tractor Co. Pulling tool with adapter for use in confined spaces. 4,091,519, Cl. 29-427.000.
Dussaussoy, Pierre; Mongin, Pierre; Rouviere, Rene; and Simon, Gilbert, to Commissariat a l'Energie Atomique. Assembly of tubes for isotopic separation diffusers. 4,092,135, Cl. 55-158.000.
Dust Rack, Inc.: *See*—
Montgomery, Ronald R., 4,091,767, Cl. 119-157.000.
Dworkin, Robert E.: *See*—
White, Benjamin J.; Moreau, George; and Dworkin, Robert E., 4,092,610, Cl. 330-207.00A.
Dye, Homer S.; and Hamner, Lloyd V., to Pacific Clay Products. Apparatus for making ceramic articles. 4,092,092, Cl. 425-291.000.
Dye, James H., to Subterranean Tools Inc. Seal arrangement for rolling cutter. 4,092,054, Cl. 308-8.200.
Dygert, Edwin S. Rod seal installation tool. 4,091,521, Cl. 29-451.000.
Dymling, Hans Harald: *See*—
Parsson, Nils Owe; and Dymling, Hans Harald, 4,092,387, Cl. 264-46.600.
Dynamit Nobel Aktiengesellschaft: *See*—
Bunger, Heinrich, 4,092,481, Cl. 560-77.000.
Dziedzic, Joseph Martin: *See*—
Ashkin, Arthur; and Dziedzic, Joseph Martin, 4,092,535, Cl. 250-251.000.
E. R. Squibb & Sons, Inc.: *See*—
Breuer, Hermann; and Treuner, Uwe D., 4,092,475, Cl. 544-21.000.
Hauck, Frederic Peter; Reid, Joyce; Narayanan, Venkatachala L.; Cimarusti, Christopher M.; Haugwitz, Rudiger D.; and Sundeen, Joseph E., 4,092,318, Cl. 260-293.560.
E-Systems, Inc.: *See*—
Daboub, Henry A.; Henderson, Charles R.; and Balthrop, Chris A., 4,092,525, Cl. 235-463.000.
Eachus, Joseph J., to Honeywell Information Systems Inc. Clockless serial data transfer. 4,092,492, Cl. 178-68.000.
Earl, Robert Arthur: *See*—
Townsend, Leroy B.; Wise, Dean Sylvester; and Earl, Robert Arthur, 4,092,472, Cl. 536-1.000.
Easley, Richard Arlen. Trotline reel. 4,091,559, Cl. 43-54.50A.
Easter, William M.; Wilhere, Charles V.; and Walker, George M., to

Horix Manufacturing Company. Container filling machine with adjustable dispensing cylinder. 4,091,969, Cl. 222-309.000.

Eastlick, David Thomas, to Glaxo Laboratories Limited. Oxidation of hydrazones to the corresponding diazo compounds in the presence of a phase transfer and an oxidation catalyst which is iodine, an iodide or an iodonium salt. 4,092,306, Cl. 260-141.000.

Eastman Kodak Company: *See*—
Columbus, Richard L., 4,091,802, Cl. 128-2.00F.
Holmes, Jerry D., 4,092,270, Cl. 252-454.000.
Novak, Carl Peter; Morrison, Edward Dixon; and Leszyk, Gerald Martin, 4,092,173, Cl. 96-119.00R.
Wright, Hal Eldon; and Berwick, Martin Alfred, 4,092,162, Cl. 96-1.50N.

Eaton Corporation: *See*—
Bojas, Edward J.; and Ours, David C., 4,091,717, Cl. 91-498.000.
Cornell, Charles R., 4,091,617, Cl. 60-445.000.

Eaton-Williams, Raymond Herbert. Electrode boiler. 4,092,519, Cl. 219-284.000.

Eberle, Robert T., to Olinkraft, Inc. Container having improved filling valve. 4,091,986, Cl. 229-62.500.

Ebner, Peter R., to Itek Corporation. Font segment front loading device. 4,092,702, Cl. 354-15.000.

Edmondson, Jerry M.; and Smoot, Mark H. Geothermal actuated method of producing fresh water and electric power. 4,091,623, Cl. 60-641.000.

Edmunds, Robert H.; Huebner, John R.; Skurka, James A.; and Wilson, Francis B., to Vapor Corporation. Freezeproof breather valve. 4,091,837, Cl. 137-341.000.

Edo, Hideo: *See*—
Sato, Toshiyuki; and Edo, Hideo, 4,092,036, Cl. 285-337.000.

Edwards, Reginald Harold: *See*—
French, Tom; Edwards, Reginald Harold; and Powell, Leslie Vernon, 4,091,854, Cl. 152-158.000.

Edwin Cooper and Company Limited: *See*—
Lowe, Alexander George; Derbyshire, Philip Edward; and Papay, Andrew George, 4,092,341, Cl. 260-429.900.

Egler, Vernon C., to Kendall Company, The. Catheter package. 4,091,922, Cl. 206-364.000.

Eguchi, Taro: *See*—
Hino, Masanori; Eguchi, Taro; and Shiraga, Chitoshi, 4,091,891, Cl. 181-185.000.

Ehrgott, Roland: *See*—
Widemann, Rudolf; and Ehrgott, Roland, 4,092,622, Cl. 336-192.000.

Eigenbrode, George Thomas, to Du Pont de Nemours, E. I., and Company. Connector block. 4,092,058, Cl. 339-218.00M.

Elam, James O. Double cuffed endotracheal tube. 4,091,816, Cl. 128-351.000.

Eldon Industries, Inc.: *See*—
Soulakis, George; and Mandala, Charles G., 4,091,918, Cl. 206-45.130.

Electric Power Research Institute: *See*—
Ying, Sui-Chun; and Cooper, Glen D., 4,092,555, Cl. 310-52.000.

Electricite de France (Service National): *See*—
Goudal, Philippe, 4,092,129, Cl. 48-210.000.

Eli Lilly and Company: *See*—
Matsumoto, Ken, 4,092,344, Cl. 260-465.00F.

Eller, Thomas: *See*—
Parsons, George H., Jr.; and Eller, Thomas, 4,092,479, Cl. 548-312.000.

Elliott Brothers (London) Limited: *See*—
Ellis, Stafford Malcolm, 4,092,072, Cl. 356-152.000.

Ellis, Christopher Ian Arthur; and Naylor, Edward Leonard. Device for detecting predetermined foaming conditions in fluids. 4,091,833, Cl. 137-93.000.

Ellis, Edric; Gelder, Richard; and Hale, Allan, to Pilkington Brothers Limited. Photochromic glasses. 4,092,174, Cl. 106-53.000.

Ellis, Stafford Malcolm, to Elliott Brothers (London) Limited. Optical sensors. 4,092,072, Cl. 356-152.000.

Emanuel, Ervin Mitchel. Apparatus for testing the performance of electric motors. 4,091,662, Cl. 73-116.000.

Emerson Electric Co.: *See*—
Steiner, Robert E., 4,091,799, Cl. 126-271.000.

Engelhard Minerals & Chemicals Corp.: *See*—
Zbranek, Vladimir; Zbranek, Zdenka; and Burnham, Daniel Arthur, 4,092,400, Cl. 423-54.000.

EnMail Machine Corporation: *See*—
Jones, Charles L., 4,091,596, Cl. 53-31.000.

Ennen, Peter: *See*—
Meisner, Alfred; Arnold, Werner; and Ennen, Peter, 4,091,612, Cl. 58-85.500.

Entenman, Alan W.: *See*—
Dickinson, Robert V. C.; Entenman, Alan W.; and Kliphuis, Jans, 4,092,596, Cl. 325-49.000.

Entreprise de Recherches et d'Activites Petrolieres (E.R.A.P.): *See*—
Chapelet, Gilbert; Knoche, Hubert; and Marie, Gilbert, 4,092,255, Cl. 252-50.000.

Epstein, Peter F.; and McGuire, Willis C., to Stauffer Chemical Company. (Tetrachloro-fluoro-ethyl-thio)N-phenyl sulfonamides and their use in controlling pests. 4,092,429, Cl. 424-321.000.

Eriksson, Hans Edvin Ake; Kaberg, Bengt Sune; and Rehnovist, Nils Torsten, to Bulten Kanthal Aktiebolag. Process of zinc coating fasteners. 4,092,224, Cl. 204-32.00R.

Escher Wyss Limited: *See*—
Lehmann, Helmuth; Lehmann, Rolf; and Christ, Alfred, 4,091,517, Cl. 29-113.0AD.
Lehmann, Rolf; and Christ, Alfred, 4,091,862, Cl. 164-447.000.

Estes, Robert T.: *See*—
MacLean, Donald L.; and Estes, Robert T., 4,092,299, Cl. 260-75.00T.

Ettenberg, Michael, to RCA Corporation. Multi-layer reflector for electroluminescent device. 4,092,659, Cl. 357-18.000.

Evans, Geoffrey Ian: *See*—
Gordon, Stuart; and Evans, Geoffrey Ian, 4,092,186, Cl. 149-10.000.

Evans Products Company: *See*—
Patch, Edward, 4,091,745, Cl. 105-498.000.

Evers, William J.: *See*—
Mookherjee, Braja Dulal; Evers, William J.; and Goossens, Alfred E., 4,092,333, Cl. 260-347.200.

Evers, William John: *See*—
Mookherjee, Braja Dulal; Withycombe, Donald Arthur; Katz, Ira; Goossens, Alfred E.; Vock, Manfred Hugo; Evers, William John; Vinals, Joaquin F.; and Kiwala, Jacob, 4,092,334, Cl. 260-347.200.

Ewing, James J.: *See*—
von Rosenberg, Charles W., Jr.; Ewing, James J.; Center, Robert E.; and Chen, Hao-Lin, 4,092,405, Cl. 423-580.000.

Exxon Production Research Company: *See*—
Hoyer, Wilmer A., 4,091,869, Cl. 166-259.000.
Maus, Leo Donald, 4,091,881, Cl. 175-7.000.

Exxon Research & Engineering Co.: *See*—
Longo, John M.; and Maas, Edward T., Jr., 4,092,265, Cl. 252-301.10W.
Michner, James G., 4,092,576, Cl. 318-314.000.
Moser, William R., 4,092,239, Cl. 208-213.000.
Ryer, Jack; and Dooley, Martin F., 4,092,127, Cl. 44-63.000.
Scher, Herbert I.; Ungar, Israel S.; and Lex, Joseph A., 4,092,198, Cl. 156-222.000.
Schlosberg, Richard H.; Maa, Peter S.; and Neavel, Richard C., 4,092,235, Cl. 208-8.000.
Ungar, Israel S.; Scher, Herbert I.; and Williams, Delbert A., 4,092,199, Cl. 156-222.000.

F. Hanau S. A.: *See*—
Gaignoux, Daniel Clement; and Pinot, Jean-Pierre, 4,092,111, Cl. 21-93.000.

F. J. Littell Machine Company: *See*—
Johnson, Kenneth C., 4,091,649, Cl. 72-183.000.

Fabian, Gordon R., to Rockwell International Corporation. Elimination of voter caused deadzone. 4,092,578, Cl. 318-564.000.

Fairchild Camera and Instrument Corp.: *See*—
Chau, Yuk Bun; Niu, George; and Staffelbach, Rudolph, 4,092,589, Cl. 324-73.00R.

Fairgrieve, John Scott: *See*—
Mao, James Chieh-Hsia; Seely, John Hunter; and Fairgrieve, John Scott, 4,092,412, Cl. 424-212.000.

Faiveley S.A.: *See*—
Favrel, Michel, 4,091,570, Cl. 49-118.000.

Fang, Frank Fu; and Herrell, Dennis James, to International Business Machines Corporation. Josephson logic circuit powering arrangement. 4,092,553, Cl. 307-306.000.

Farkas, Lorand; Nogradi, Mihaly; Pfliegel, Todor; Antus, Sandor; and Gottsegen, Agnes, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. Acyl-phenoxy-propanesulfoacids and salts, and artificial sweetening compositions containing the same. 4,092,346, Cl. 260-511.000.

Farnham, William D.: *See*—
Zimbardi, Dominic J., 4,092,136, Cl. 55-212.000.

Farooq, Saleem; and Karrer, Friedrich, to Ciba-Geigy Corporation. Diphenyl ether acetals. 4,092,365, Cl. 260-613.00R.

Farrell, Thomas Michael, to Cincinnati Milacron Inc. Grinding wheel dresser unit with improved heat transferring capability. 4,091,792, Cl. 125-11.0CS.

Faser Industries: *See*—
Lewis, Robert P., 4,091,921, Cl. 206-363.000.

Fatur, Richard N.: *See*—
Brown, Vaikai K.; and Fatur, Richard N., 4,091,889, Cl. 180-101.000.

Favrel, Michel, to Faiveley S.A. Oblique-displacement sliding door. 4,091,570, Cl. 49-118.000.

Fedders Corporation: *See*—
Daily, Thomas Edward, 4,091,548, Cl. 34-133.000.

Fehn, Allan J. Modified tunnel hull boat. 4,091,761, Cl. 114-290.000.

Fehr, Ivor John Martin; and Wheable, Desmond, to Bell & Howell Limited. Pressure responsive apparatus. 4,091,669, Cl. 73-299.000.

Ference, Joseph, to Corning Glass Works. Process for making colored photosensitive glass. 4,092,139, Cl. 65-30.00R.

Ferguson, Eldon Glen: *See*—
Handy, Richard L.; Ferguson, Eldon Glen; Barksdale, Richard D.; Fox, Nathaniel S.; and Trott, Gary, 4,091,661, Cl. 73-88.00E.

Fernholz, Hans; Krekeler, Hans; Schmidt, Hans-Joachim; and Wunder, Friedrich, to Hoechst Aktiengesellschaft. Process for regenerating palladium catalysts. 4,092,267, Cl. 252-413.000.

Fetter, Paul Edward. Car smokers safety tray. 4,092,008, Cl. 248-205.00A.

F'Geppert, Erwin, to United States of America, Army. Pump lock-up power transmission. 4,091,901, Cl. 192-61.000.

FIAT Societa per Azioni: *See*—
Amedei, Giuseppe; Quilico, Carlo Alberto; and Maggioni, Virginio, 4,092,047, Cl. 303-22.00R.
Di Nunzio, Vittorio, 4,092,717, Cl. 364-431.000.

Fiedler, Kurt: *See*—
Meinke, Peter; and Fiedler, Kurt, 4,091,687, Cl. 74-574.000.

Field, Nathan D.: *See—*
Huber, William; Field, Nathan D.; Marder, Herman L.; and Cole, Raymond C., 4,091,819, Cl. 128-479.000.
Filper Corporation: *See—*
Pelster, Edwin Joseph; Kipers, Richard Franc; and Kilner, George Earl, 4,091,595, Cl. 53-14.000.
Fischer, Hanspeter; and Bellus, Daniel, to Ciba-Geigy Corporation. Compositions, methods and new compounds for influencing plant growth. 4,092,146, Cl. 71-70.000.
Fischer, Paul W.; and Pye, David S., to Union Oil Company of California. Controlling corrosion in gas-containing aqueous drilling fluid. 4,092,252, Cl. 252-8.50A.
Fischer, Raymond C., to International Harvester Company. Tractor mounted multiple bale carrier. 4,091,947, Cl. 214-766.000.
Fisher Scientific Company: *See—*
Buck, Francis Fremonte, 4,092,114, Cl. 23-230.00B.
Fisher, William Bernard: *See—*
Van Peppen, Jan F.; and Fisher, William Bernard, 4,092,360, Cl. 260-586.00P.
Fisons Limited: *See—*
Van Hoogstraten, Samuel David, 4,092,149, Cl. 71-90.000.
Flanagan, Joseph E., to Rockwell International Corporation. Hot nitrogen generator containing calcium oxide. 4,092,190, Cl. 149-35.000.
Fleming, Garold Lee: *See—*
White, Allen Andrew; Yatcilla, George; and Fleming, Garold Lee, 4,091,724, Cl. 100-21.000.
Fletcher, Gerald M., to Xerox Corporation. Unfused image transport. 4,092,021, Cl. 271-176.000.
FMC Corporation: *See—*
Treves, Gino R., 4,092,150, Cl. 71-92.000.
Foltz, Carl L.: *See—*
Troutner, Vernon H.; Foltz, Carl L.; and Trott, Arthur F., 4,091,880, Cl. 173-163.000.
Fontana, Emilio; Fontana, Rocco; and Schiffelholz, Walter. Method of inhibiting bird-nesting at an airport. 4,091,625, Cl. 61-35.000.
Fontana, Rocco: *See—*
Fontana, Emilio; Fontana, Rocco; and Schiffelholz, Walter, 4,091,625, Cl. 61-35.000.
Forage King Industries, Inc.: *See—*
Krueger, Kenneth A.; and Meyer, Daniel R., 4,091,972, Cl. 222-627.000.
Ford Motor Company: *See—*
Kaufman, Sydney M., 4,092,223, Cl. 204-23.000.
Siwiec, Elaine C.; Van Oene, Henk; and Theodore, Ares N., 4,092,373, Cl. 260-830.00R.
Forrester, Joseph J.: *See—*
Castelli, Joseph Tom; and Forrester, Joseph J., 4,091,791, Cl. 124-73.000.
Foster, Robert; Preston, Roger Edwin; and Robinson, Graham Ernest, to Imperial Chemical Industries Limited. Hydrazine derivatives of pyridyl-ketones. 4,092,323, Cl. 260-295.00H.
Fowler, James H.: *See—*
Padovani, Francois A.; Miller, Michael Brant; Moore, James A.; Fowler, James H.; June, Malcolm Neville; Matthews, James D.; Morton, T. R.; Stotko, Norbert A.; and Palmer, Lewis B., 4,092,446, Cl. 427-213.000.
Fowler, Steven E.: *See—*
Redmond, Stephen L.; and Fowler, Steven E., 4,091,734, Cl. 102-70.20R.
Fowles, Thomas A.; and Winchell, David A., to Baxter Travenol Laboratories, Inc. Antibackoff threaded ring closure using ratchet means. 4,091,949, Cl. 215-251.000.
Fowlkes, P. Dwaine: *See—*
Damiani, Robert A.; and Fowlkes, P. Dwaine, 4,092,378, Cl. 260-990.000.
Fox, Gaston M.; and Wright, Thomas H., to Barker International, Inc. Neck-breaking and stretching apparatus for poultry. 4,091,503, Cl. 17-11.000.
Fox, Morton H.: *See—*
Coontz, Leland I.; and Fox, Morton H., 4,092,733, Cl. 365-200.000.
Fox, Nathaniel S.: *See—*
Handy, Richard L.; Ferguson, Eldon Glen; Barksdale, Richard D.; Fox, Nathaniel S.; and Trott, Gary, 4,091,661, Cl. 73-88.00E.
Fozzard, George B., to Phillips Petroleum Company. Constant boiling admixtures of toluene/perfluoro-n-heptane. 4,092,257, Cl. 252-66.000.
Frampton, Charles H., to United States of America, Navy. Autokinetic sampling nozzle. 4,091,835, Cl. 137-118.000.
Francis Shaw & Co. Ltd.: *See—*
Aspin, Anthony Frank, 4,091,607, Cl. 57-140.00R.
Franck, Jean-Pierre; and Le Page, Jean-Francois, to Institut Francais du Petrole. Process for manufacturing a catalyst comprising aluminum oxide and boron oxide, the resulting catalyst and the use thereof in alkylation reactions. 4,092,371, Cl. 260-671.00C.
Frank, Gunter, to Kyberna GmbH. Ignition device for internal combustion engines. 4,091,787, Cl. 123-148.00E.
Frank, Robert G.; and Lampman, DeWitt W., to PPG Industries, Inc. Method and apparatus for handling glass sheets for shaping and cooling. 4,092,141, Cl. 65-114.000.
Frankel, Milton B.; and Ogimachi, Naomi N., to Rockwell International Corporation. Dinitrocyanoalkyl epoxides. 4,092,336, Cl. 260-348.450.
Franks, Dorothy G., administratrix: *See—*
Franks, Robert E., deceased; and Franks, Dorothy G., administratrix, 4,092,245, Cl. 210-64.000.
Franks, Robert E., deceased; and by Franks, Dorothy G., administratrix, to Goetz, Trustee Sylvia. Liquid purification method. 4,092,245, Cl. 210-64.000.
Franz Plasser Bahnbaumaschinen-Industriegesellschaft M.B.H.: *See—*
Theurer, Josef; and Riessberger, Klaus, 4,091,739, Cl. 105-224.00R.
Fravel, John C.: *See—*
Chang, Louis H.; Fravel, John C.; Herendeen, Carl E.; and Ruble, Frank D., 4,091,911, Cl. 400-70.000.
Frazer, Gerald Lee, to Bell Telephone Laboratories, Incorporated. Differential encoding and decoding scheme for digital transmission systems. 4,092,491, Cl. 178-67.000.
Frazier, Robert Doyal: *See—*
Chambley, Phillip Wayne; Norris, Alan Hedley; Frazier, Robert Doyal; and Cromer, Dwain Edwin, 4,091,512, Cl. 28-171.000.
Frederick, Judson G.; Mercer, Benjamin, Jr.; and Poole, John E., to Owens-Illinois, Inc. Coating apparatus including transfer means. 4,092,447, Cl. 427-286.000.
Frederiksen, Thomas M.; Sleeth, Robert S.; and Howard, William M., to National Semiconductor Corporation. Adaptively biased differential operational amplifier for photo diode. 4,092,611, Cl. 330-261.000.
Freerks, Marshall C.; and Randle, Seth, Sr., to Monsanto Company. Process for manufacturing maleic anhydride. 4,092,332, Cl. 260-346.750.
French, John Barry; Reid, Neil M.; and Buckley, Janette A., to Governing Counsel of the University of Toronto, The. Method and apparatus for analyzing trace components using a cryopumpable reagent gas. 4,091,655, Cl. 73-23.000.
French, Tom; Edwards, Reginald Harold; and Powell, Leslie Vernon, to Dunlop Holdings Limited. Tire and wheel assemblies. 4,091,854, Cl. 152-158.000.
Frew, Duncan W.: *See—*
Goodson, Keith S.; and Frew, Duncan W., 4,092,256, Cl. 252-62.540.
Friedman, Maurice W.: *See—*
Vulcano, Vincent N.; and Friedman, Maurice W., 4,091,598, Cl. 53-241.000.
Friedrich Deckel Aktiengesellschaft: *See—*
Geiger, Michael, 4,091,712, Cl. 90-11.00F.
Frielingsdorf, Hans: *See—*
Gruber, Wolfgang; Frielingsdorf, Hans; and Mueller-Tamm, Heinz, 4,092,468, Cl. 526-105.000.
Frigato, Giovanni, to Sandoz Ltd. Apparatus for automatically preparing solution of controlled concentration. 4,091,834, Cl. 137-93.000.
Fritzsche, Wilfried: *See—*
Schweiger, Fritz; and Fritzsche, Wilfried, 4,092,217, Cl. 176-58.0PB.
Frulla, Floro F.; Sayigh, Adnan A. R.; Ulrich, Henri; and Whitman, Peter J., to Upjohn Company, The. Polymethylene polyphenyl polyisocyanate. 4,092,343, Cl. 260-453.0AM.
Fuchs, Gundolf: *See—*
Humbert, Heiko; Fuchs, Gundolf; and Pirck, Dietrich, 4,092,298, Cl. 260-75.00T.
Fuji Photo Film Co., Ltd.: *See—*
Kumasaka, Isao, 4,092,169, Cl. 96-86.00R.
Fujii, Isamu: *See—*
Namikawa, Kosuke; Onoda, Hajime; Okamoto, Mineo; Fujii, Isamu; Matsuda, Takaaki; Uebayashi, Mustuo; and Suzuki, Hirosi, 4,091,668, Cl. 73-263.000.
Fujii, Setsuro: *See—*
Yasumoto, Mitugi; Yamashita, Junichi; Yamawaki, Ichiro; Unemi, Norio; Kitazato, Kenji; Hashimoto, Sadao; and Fujii, Setsuro, 4,092,313, Cl. 544-313.000.
Fujikawa, Kanichi: *See—*
Takahashi, Ryohei; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; and Sakashita, Nobuyuki, 4,092,151, Cl. 71-94.000.
Fujioka, Tomio: *See—*
Tsurumi, Yoshihiro; and Fujioka, Tomio, 4,092,220, Cl. 195-30.000.
Fujisawa Pharmaceutical Co., Ltd.: *See—*
Aoki, Hatsuo; Nishiura, Toyozi; and Imanaka, Hiroshi, 4,092,411, Cl. 424-114.000.
Fujita, Seigoro; and Kitahori, Tojiro, to Kanzaki Paper Manufacturing Co., Ltd. Method for the production of a synthetic fiber paper having an improved printability for offset printing and the product thereof. 4,092,457, Cl. 428-341.000.
Fukuda, Yoshio; Suzuki, Jugoro; Fukuma, Toshiaki; and Takada, Michinosuke, to Shimadzu Seisakusho Ltd. Spectrophotometer. 4,092,069, Cl. 356-88.000.
Fukuichi, Takuro, to Kabushiki Kaisha Daini Seikosha. Digital alarm watch. 4,091,611, Cl. 58-57.500.
Fukuma, Toshiaki: *See—*
Fukuda, Yoshio; Suzuki, Jugoro; Fukuma, Toshiaki; and Takada, Michinosuke, 4,092,069, Cl. 356-88.000.
Fukumoto, Tsumoru: *See—*
Okamoto, Rokuro; Fukumoto, Tsumoru; Takamatsu, Akira; and Takeuchi, Tomio, 4,092,473, Cl. 536-17.000.
Fukushi, Osamu: *See—*
Yoshizumi, Hajime; Matsumoto, Nobuya; and Fukushi, Osamu, 4,092,434, Cl. 426-13.000.
Funcik, Jack F.; Bennett, Joseph C.; and Fusco, Vito A., deceased (by Fusco, Mary, legal representative, by Janet Fusco, heir, by Michael Fusco, heir), to Molex Incorporated. Wire preparation machine with variable insulation stripping mechanism. 4,091,695, Cl. 81-9.510.
Furuno, Kouji: *See—*
Mori, Takashi; Takaku, Sakae; Oi, Nobuhiro; Shindo, Minoru; Hirano, Takeaki; Kataoka, Shigeyuki; and Furuno, Kouji, 4,092,431, Cl. 424-324.000.
Furuoya, Itsuo; Kobayashi, Atsuo; and Ogino, Katsuhiko, to Takeda

Chemical Industries, Ltd. Catalyst for the production of isoprene. 4,092,372, Cl. 260-681.000.

Furusawa, Kaoru; and Ishigami, Sumiyuki, to Meisei Electric Co., Ltd.; and Tokyo Denpa Company Ltd. Vibrating quartz accelerometer. 4,091,679, Cl. 73-497.000.

Fusco, Mary, legal representative, by Janet Fusco, heir, by Michael Fusco, heir: *See—*
Funcik, Jack F.; Bennett, Joseph C.; and Fusco, Vito A., deceased, 4,091,695, Cl. 81-9.510.

Fusco, Vito A., deceased: *See—*
Funcik, Jack F.; Bennett, Joseph C.; and Fusco, Vito A., deceased, 4,091,695, Cl. 81-9.510.

G. D. Searle & Co.: *See—*
Jones, David A., Jr.; Schlatter, James M.; Mikulec, Richard A.; and Reuter, Judith A., 4,092,304, Cl. 260-112.50R.

GAF Corporation: *See—*
Meyer, John E.; and Little, David C., 4,092,441, Cl. 427-37.000.

Gaidis, James Michael: *See—*
Rosenberg, Arnold Morry; and Gaidis, James Michael, 4,092,109, Cl. 21-2.50R.

Gaignoux, Daniel Clement; and Pinot, Jean-Pierre, to F. Hanau S. A.; and Barriquand. Apparatus for the heat treatment of products contained in sealed containers. 4,092,111, Cl. 21-93.000.

Gallagher, Paul H. Continuous laundering apparatus. 4,091,645, Cl. 68-158.000.

Galloway, Vernon W. Welding booths. 4,091,719, Cl. 98-33.00A.

Garrett Corporation, The: *See—*
Ryan, William Francis, 4,091,716, Cl. 91-49.000.

Gatti, Anthony R.; Hokanson, James S.; and Nozaki, Kenzie, to Shell Oil Company. Fuel and lubricant compositions for inhibition of prevention of octane requirement increase. 4,092,126, Cl. 44-51.000.

Gebhard, Albert W., to Gerico, Inc. Combined feeding spout and cap attachment. 4,091,965, Cl. 222-192.000.

Gehl Company: *See—*
Leverenz, John H.; Mocho, John H.; and Ambroziak, Robert E., 4,092,004, Cl. 241-56.000.

Geiger, Michael, to Friedrich Deckel Aktiengesellschaft. Spindlehead with spindle driving motor. 4,091,712, Cl. 90-11.00F.

Gelder, Richard: *See—*
Ellis, Edric; Gelder, Richard; and Hale, Allan, 4,092,174, Cl. 106-53.000.

Gele, Pierre J.: *See—*
Laprade, Bernard R.; Laprade, Xavier J.; and Gele, Pierre J., 4,091,783, Cl. 123-124.00B.

Gelernter, Boaz: *See—*
Borowick, John Joseph; Gelernter, Boaz; Lipetz, Nathan; and Stern, Richard A., 4,092,647, Cl. 343-768.000.

Gelfand, Samuel, to Hooker Chemicals & Plastics Corp. Process for the preparation of chloroalkylbenzene chlorides. 4,092,369, Cl. 260-651.00R.

Geller, Stephen I.: *See—*
Norton, Thomas R.; and Geller, Stephen I., 4,092,714, Cl. 364-200.000.

General Dynamics Corporation Electronics Division: *See—*
Osterwalder, Johann Martin, 4,092,616, Cl. 333-6.000.

General Electric Company: *See—*
Bennett, James Gordy, Jr.; and Cooper, Glenn Dale, 4,092,294, Cl. 260-47.0ET.
Bochan, John, 4,091,546, Cl. 34-73.000.
Bochan, John, 4,091,644, Cl. 68-18.00F.
Boldebuck, Edith M., 4,092,300, Cl. 260-78.0UA.
Calkins, Thornton Ross; and Jaquiss, Donald Benjamin George, 4,092,288, Cl. 260-37.0PC.
Campbell, John H., 4,092,562, Cl. 315-189.000.
Dinkler, Leonard R.; and Herrin, Jerry, 4,092,586, Cl. 324-28.0RS.
Giaever, Ivar, 4,092,116, Cl. 23-230.00B.
Greer, Carl R.; and Denham, Clarence W., Jr., 4,092,031, Cl. 280-28.500.
Hehmann, Horst W. W.; and Kraft, Robert E., 4,091,892, Cl. 181-286.000.
Hopkins, Robert John; Stitt, Thomas Detlor; and Vitt, Hillert, 4,092,571, Cl. 318-106.000.
Mark, Victor, 4,092,291, Cl. 260-45.70S.
Milkovic, Miran, 4,092,592, Cl. 324-142.000.
Neal, Wayne R., 4,092,565, Cl. 315-283.000.
Pao, Chia Tung; and Green, Walter K., 4,092,539, Cl. 250-336.000.
Schaeffer, Robert L., 4,091,551, Cl. 38-77.830.
Smith, William E., 4,092,368, Cl. 568-877.000.
Soileau, Trasimond A., 4,092,564, Cl. 315-208.000.
Stetson, Earl W., 4,092,694, Cl. 361-126.000.
Stucker, Harold Lloyd, 4,092,184, Cl. 148-103.000.
Wilkinson, Stanley B., 4,092,690, Cl. 361-80.000.
Williams, Frank J., III, 4,092,297, Cl. 260-47.0CP.
Zavitsanos, Peter D., 4,092,263, Cl. 252-181.400.
Ziemba, Richard Thomas, 4,091,733, Cl. 102-70.2GA.

General Electric Company Limited, The: *See—*
Newbould, Adrian Orton, 4,092,582, Cl. 323-48.000.
Williams, Anthony, 4,092,691, Cl. 361-80.000.

General Motors Corporation: *See—*
Stevenson, Paul D., 4,091,899, Cl. 192-3.300.

General Resource Corp.: *See—*
Nemesi, Steve A., 4,092,088, Cl. 417-360.000.

General Signal Corporation: *See—*
Carlson, William L., Jr., 4,092,010, Cl. 251-4.000.

Genis, Semen Naumovich; Zhivov, Adolf Nikolaevich; Pereyaslavtsev, Nikolai Alexandrovich; Sukhenko, Igor Vladimirovich; Vasyagina, Nadezhda Grigorievna; and Shotsky, Viktor Ivanovich. Wall of pressurized reinforced concrete tank. 4,091,583, Cl. 52-81.000.

George, Henry Howard, to Chemetron Corporation. Structural connector. 4,092,077, Cl. 403-178.000.

George, Kurudamannil A., to SCM Corporation. Solar air heater array. 4,091,797, Cl. 126-270.000.

Geotechnical Research, Inc.: *See—*
Handy, Richard L.; Ferguson, Eldon Glen; Barksdale, Richard D.; Fox, Nathaniel S.; and Trott, Gary, 4,091,661, Cl. 73-88.00E.

Gerber Garment Technology, Inc.: *See—*
Pearl, David R., 4,091,701, Cl. 83-747.000.

Gerber, Heinz Joseph, to Gerber Scientific Instrument Company. Apparatus for advancing sheet material. 4,091,980, Cl. 226-162.000.

Gerber Scientific Instrument Company: *See—*
Gerber, Heinz Joseph, 4,091,980, Cl. 226-162.000.

Gerbig, Hans-Erwin: *See—*
von Starck, Axel; and Gerbig, Hans-Erwin, 4,092,086, Cl. 417-50.000.

Gerding, James H.; and Heyman, Albert M., to Honeywell Information Systems Inc. Power supply with overcurrent protection. 4,092,708, Cl. 363-56.000.

Gerding, James H.; and Heyman, Albert M., to Honeywell Information Systems Inc. Power supply with automatic shutdown. 4,092,711, Cl. 363-53.000.

Gerico, Inc.: *See—*
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Gewerkschaft Eisenhutte Westfalia: *See—*
Loweg, Heribert, 4,091,616, Cl. 60-295.000.

Giaccone, Sylvester: *See—*
Barouh, Victor; Rottmann, George; and Giaccone, Sylvester, 4,092,280, Cl. 260-23.0XA.

Giacin, Jack R.: *See—*
Lin, Po-Min; Giacin, Jack R.; Gilbert, Seymour G.; and Leeder, Joseph G., 4,092,219, Cl. 195-29.000.

Giaever, Ivar, to General Electric Company. Method for binding antibodies to a surface such that they remain active. 4,092,116, Cl. 23-230.00B.

Giangiulio, Clayton. Scraper. 4,091,579, Cl. 51-181.00R.

Gibson, Harry W.; and Saeva, Franklin D., to Xerox Corporation. Imaging process utilizing silylated coated carrier. 4,092,163, Cl. 96-15.00D.

Giess, Herbert; Burrows, Brian; and Janssoone, Marie-Michelle, to Battelle Memorial Institute. Electrode grids for lead accumulators. 4,092,462, Cl. 429-50.000.

Gilbert, Seymour G.: *See—*
Lin, Po-Min; Giacin, Jack R.; Gilbert, Seymour G.; and Leeder, Joseph G., 4,092,219, Cl. 195-29.000.

Gildemeister Corpoplast GmbH: *See—*
Appel, Adolf; and Reymann, Wolfgang, 4,092,097, Cl. 432-11.000.

Gillette Company, The: *See—*
Ascoli, Enzo, 4,092,581, Cl. 320-2.000.

Gilman, Gareld I.: *See—*
Bellinghausen, Thomas A.; and Gilman, Gareld I., 4,092,641, Cl. 340-409.000.

Giros, Marcel A. P., to Societe Anonyme des Elevateurs Lateraux. Handling installation for supporting displacing and stacking loads in predetermined positions. 4,091,737, Cl. 104-242.000.

Glass Master Sales and Leasing Corporation: *See—*
Cailey, Ronald J., 4,091,697, Cl. 83-5.000.

Glaxo Laboratories Limited: *See—*
Cook, Martin Christopher; Gregory, Gordon Ian; and Bradshaw, Janice, 4,092,477, Cl. 544-26.000.
Eastlick, David Thomas, 4,092,306, Cl. 260-141.000.

Gleason, John Gerald, to SmithKline Corporation. Intermediates for preparing substituted phenylglycylcephalosporins. 4,092,480, Cl. 560-37.000.

Glennie, Shirley Lorraine. Emergency display apparatus and methods of constructing and utilizing same. 4,091,553, Cl. 40-591.000.

Goble, Paul H.: *See—*
Harris, Richard L.; and Goble, Paul H., 4,092,293, Cl. 260-47.0EC.

Godfrey, Charles S.; and Moore, E. T., Jr., to Physics International Company. Method for generating horizontal fractures in a wellbore. 4,091,870, Cl. 166-299.000.

Goetz, Trustee Sylvia: *See—*
Franks, Robert E., deceased; and Franks, Dorothy G., administratrix, 4,092,245, Cl. 210-64.000.

Goetzewerke Friedrich Goetze AG: *See—*
Beyer, Horst; and Buran, Ulrich, 4,092,158, Cl. 75-254.000.

Goldfarb, Louis: *See—*
Dieck, Ronald L.; Goldfarb, Louis; and Hann, Nancy D., 4,092,278, Cl. 260-2.50R.

Goldring, Grigory Mikhailovich; Koiler, Semen Nusievich; Losev, Vladimir Fedorovich; Pepenko, Vladimir Danilovich; Platov, Evgeny Ivanovich; Rabinovich, Benedikt Veniaminovich; and Sakhanovich, Jury Viktorovich. Apparatus for making molds by sequential squeezing. 4,091,858, Cl. 164-212.000.

Gollnick, Cyril R., to Leach Company. Front end loader refuse collection body. 4,091,944, Cl. 214-302.000.

Gonzalez-Dorner, Alberto Carlos: *See—*
Reischl, Artur; Jabs, Gert; Dietrich, Werner; and Gonzalez-Dorner, Alberto Carlos, 4,092,275, Cl. 260-2.5BD.

Goodenow, Robert H.: *See—*
Charpentier, Philippe L.; Goodenow, Robert H.; and Dennis, William E., 4,092,179, Cl. 148-2.000.

Goodman, Alvin Malcolm; and Weitzel, Charles Edward, to RCA Corporation. Method for adjusting the leakage current of silicon-on-

sapphire insulated gate field effect transistors. 4,091,527, Cl. 29-571.000.
Goodson, Keith S.; and Frew, Duncan W. Magnetic coating compositions. 4,092,256, Cl. 252-62.540.
Goodyear Tire & Rubber Company, The: *See*—
Miller, Rickie L.; and Walters, Noel E., 4,092,196, Cl. 156-96.000.
Goossens, Alfred E.: *See*—
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Mookherjee, Braja Dulal; Withycombe, Donald Arthur; Katz, Ira; Goossens, Alfred E.; Vock, Manfred Hugo; Evers, William John; Vinals, Joaquin F.; and Kiwala, Jacob, 4,092,334, Cl. 260-347.200.
Gordon, Stuart; and Evans, Geoffrey Ian, to Imperial Metal Industries (Kynoch) Limited. Combustion inhibited rocket propellants. 4,092,186, Cl. 149-10.000.
Goring, Joachim: *See*—
Credner, Karl; Goring, Joachim; Brenner, Gunter; and Tauscher, Manfred, 4,092,417, Cl. 424-253.000.
Goto, Kenjiro, to Mansei Kogyo Kabushiki Kaisha. Battery operated lighter equipped with a digital timepiece. 4,092,096, Cl. 431-253.000.
Gotsmann, Guenther: *See*—
Schenk, Walter; Schlecht, Helmut; and Gotsmann, Guenther, 4,092,347, Cl. 260-513.00R.
Gottsegen, Agnes: *See*—
Farkas, Lorand; Nogradi, Mihaly; Pfliegel, Todor; Antus, Sandor; and Gottsegen, Agnes, 4,092,346, Cl. 260-511.000.
Goudal, Philippe, to Electricite de France (Service National). Process for producing methane rich gas. 4,092,129, Cl. 48-210.000.
Gould, Inc.: *See*—
Rundel, Morton Stanley; and Keller, Frank R., 4,092,508, Cl. 200-291.000.
Wanser, Gerhard A. H., 4,092,485, Cl. 174-28.000.
Governing Counsel of the University of Toronto, The: *See*—
French, John Barry; Reid, Neil M.; and Buckley, Janette A., 4,091,655, Cl. 73-23.000.
Graber-Rogg, Inc.: *See*—
Martin, Harold B.; and Rogg, Herman O., 4,091,707, Cl. 84-423.000.
Gracovetsky, Serge: *See*—
Lucas, John Martin; and Gracovetsky, Serge, 4,092,068, Cl. 356-73.000.
Graham, John Earl, II, to International Business Machines Corporation. Sheet handling apparatus. 4,091,978, Cl. 225-100.000.
Graham Magnetics Incorporated: *See*—
Deffeyes, Robert J.; and Johnson, Grover Lee, 4,092,459, Cl. 428-403.000.
Newton, Gerald S., 4,091,924, Cl. 206-389.000.
Grammel, Jurgen: *See*—
Noll, Klaus; Grammel, Jurgen; and Meckel, Walter, 4,092,286, Cl. 260-29.2TN.
Granco Equipment, Inc.: *See*—
Phillips, William A., 4,092,100, Cl. 432-72.000.
Greco, Carl C.; and Walsh, Edward N., to Stauffer Chemical Company. Production of perchloromethyl mercaptan. 4,092,357, Cl. 260-543.00H.
Green, Douglas Harry; and Pickup, Joseph, to Delphic Limited. Plural sensor monitoring and display device. 4,092,642, Cl. 340-413.000.
Green, George Edward, to Ciba-Geigy Corporation. Method for making reinforced composites. 4,092,443, Cl. 427-53.000.
Green, James R., to Du Pont de Nemours, E. I., and Company. Process for making ceramic refractory oxide fiber-reinforced ceramic tube. 4,092,194, Cl. 156-89.000.
Green, Walter K.: *See*—
Pao, Chia Tung; and Green, Walter K., 4,092,539, Cl. 250-336.000.
Greenawalt, Eddie L.; and Whitaker, Charles M., to Dow Chemical Company, The. Resealable sealing assembly for inspection port hole. 4,091,842, Cl. 138-90.000.
Greenwald, Albert T. Door-locking device. 4,092,037, Cl. 292-202.000.
Greer, Carl R.; and Denham, Clarence W., Jr., to General Electric Company. Tracked support for a cabinet. 4,092,031, Cl. 280-28.500.
Gregory, Gordon Ian: *See*—
Cook, Martin Christopher; Gregory, Gordon Ian; and Bradshaw, Janice, 4,092,477, Cl. 544-26.000.
Greif Bros. Corporation: *See*—
DuBois, Robert A.; and Wagers, Rex E., 4,091,961, Cl. 220-319.000.
Greive, Aloys, to Hamel GmbH, Zwirnmaschinen. Device for the driving of yarn-takeup packages, especially for double twisting machines. 4,091,604, Cl. 57-34.00R.
Gremion, Robert: *See*—
Maire, Jacques; and Gremion, Robert, 4,092,395, Cl. 264-221.000.
Gretag Aktiengesellschaft: *See*—
Grossmann, Walter, 4,092,067, Cl. 355-77.000.
Griffin, Steven M.: *See*—
Covington, Morris T.; and Griffin, Steven M., 4,091,658, Cl. 73-40.50R.
Griffo, Gregory; and Sanders, Raymond H., to Standun, Inc. Snag resistant vented flower sleeve. 4,091,925, Cl. 206-423.000.
Grim, Stig, to Siemens Aktiengesellschaft. X-ray photographic apparatus comprising light source and receiving device arranged to facilitate the alignment of the apparatus. 4,092,544, Cl. 250-491.000.
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Grundy, Eric, to International Nickel Company, Inc., The. Directionally solidified castings. 4,092,183, Cl. 148-32.000.
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Donnelly, James Michael, 4,092,605, Cl. 328-152.000.
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Meinke, Peter; and Fiedler, Kurt, 4,091,687, Cl. 74-574.000.
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Ellis, Edric; Gelder, Richard; and Hale, Allan, 4,092,174, Cl. 106-53.000.
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Hancock, Robert D. Rail chair for transporting non-ambulatory persons. 4,091,479, Cl. 4-185.00S.
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Hardy, Stanley Matthias, to Aesculapius Scientific Limited. Preparation of blood plasma and serum samples. 4,092,113, Cl. 23-230.00B.
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Harper, Robert W.; and Shelby, Robert L., to Caterpillar Tractor Co. Radiator guard hinge pin. 4,092,074, Cl. 403-24.000.
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Hashimoto, Fujio. Drilling tool. 4,091,882, Cl. 175-286.000.
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Hayashi, Yoshimasa; Kuroda, Hiroshi; Nakajima, Yasuo; and Yoshimura, Tooru, to Nissan Motor Company, Ltd. Internal combustion engine with plural spark plugs for each combustion chamber and exhaust recirculation circuit. 4,091,615, Cl. 60-274.000.
Hayashi, Yukichi; Tamura, Masayuki; Sugimoto, Osamu; Kobayashi, Shinichi; and Tanaka, Masanori, to Nippon Coinco Co., Ltd. Coin checking device for a vending machine. 4,091,908, Cl. 194-100.00A.
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Hayes, Patrick Dewey, to United States of America, Navy. Binary apparatus for motion control. 4,092,532, Cl. 250-221.000.
Hazen, Mary C., to Roe-Mar, Inc. Sport training device. 4,092,023, Cl. 273-26.00A.
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Heckman, Russell William; and Nickey, George Allen, to Owens-Illinois, Inc. Method of heat shrinking thermoplastic sleeve wraps on glass containers. 4,092,382, Cl. 264-25.000.
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Heirich, William C. Spring action panel interlock. 4,091,588, Cl. 52-478.000.
Helixon, Michael L.; and Ward, Barry S., to Alcon Laboratories, Inc. Operator means for syringe cartridges. 4,091,812, Cl. 128-218.00D.
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Heredy, Laszlo A., to Rockwell International Corporation. Molten salt hydroconversion process. 4,092,236, Cl. 208-10.000.
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Hershman, George H., to Hughes Aircraft Company. Electronic transform system. 4,092,725, Cl. 364-826.000.
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Higuchi, Tetsuo, to Kansai Paint Co., Ltd. Photocurable composition comprising a copolymer of a maleic acid monoester with an α-olefine. 4,092,172, Cl. 96-115.00P.
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Hirs, Gene. Method and apparatus for removing water from oil storage tank. 4,091,830, Cl. 137-2.000.
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Hodge, Richard M., to Rockwell International Corporation. Digital weather radar including target severity analysis capability. 4,092,644, Cl. 343-5.00W.
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Cuntze, Ulrich; May, Adolf; and Bucking, Hans-Walter, 4,092,253, Cl. 252-8.800.
Dillmann, Gerhard, 4,092,101, Cl. 8-1.00E.
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Staendeke, Horst; and Neumaier, Hubert, 4,092,363, Cl. 260-606.50P.
Hoehn, Wolfgang, to ITT Industries, Incorporated. Bipolar monolithic integrated push-pull power stage for digital signals. 4,092,552, Cl. 307-299.00A.
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Hof, Peter John, Jr.: *See*—
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Hofferber, James A.; and Webb, Paul U., to Phillips Petroleum Company. Fluid catalytic cracking with automatic temperature control. 4,092,722, Cl. 364-500.000.
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Hoffman, James W. Convertible livestock-grain trailer. 4,092,044, Cl. 298-27.000.
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Hogberg, Karl Johan, to Medical Products Octagon AB. Method of illuminating an object and a device for carrying out the method. 4,092,705, Cl. 362-294.000.
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Holmes, Jerry D., to Eastman Kodak Company. Catalyst for the production of 2,2-disubstituted propiolactones. 4,092,270, Cl. 252-454.000.
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Hooker Chemicals & Plastics Corp.: *See*—
Gelfand, Samuel, 4,092,369, Cl. 260-651.00R.
Hoover, Richard L., to Net Posts Inc. Support post for game net. 4,092,024, Cl. 273-29.0BF.
Hopkins, Robert John; Stitt, Thomas Detlor; and Vitt, Hillert, to General Electric Company. Power matching system for a train of individually powered transit vehicles. 4,092,571, Cl. 318-106.000.
Hoppe, Lee Max: *See*—
Howe, Frank D.; and Hoppe, Lee Max, 4,092,137, Cl. 55-337.000.
Hordvik, Audun, to United States of America, Air Force. Method for the simultaneous determination of low optical bulk and surface absorption coefficients in solids. 4,091,681, Cl. 73-574.000.
Hori, Kiyoshi: *See*—
Aihara, Takayuki; Hori, Kiyoshi; and Morokuma, Tadashi, 4,092,529, Cl. 250-201.000.
Hori, Yutaka; Honda, Zenzo; Suzuki, Kenji; Nakamoto, Keiji; and Yamamoto, Yoshiharu, to Nitto Electric Industrial Co., Ltd. Plastic laminated metallic foil and method for preparing the same. 4,092,452, Cl. 428-215.000.
Horix Manufacturing Company: *See*—
Easter, William M.; Wilhere, Charles V.; and Walker, George M., 4,091,969, Cl. 222-309.000.
Horizons Incorporated a division of Horizons Research Incorporated: *See*—
Crosby, Robert J., 4,092,164, Cl. 96-27.00R.
Horst, William R.; McNaughton, James L.; and Mort, Charles F., to NCR Corporation. Method of fabricating diffraction grating masters and apparatus therefor. 4,092,234, Cl. 204-286.000.
Horster, Horst: *See*—
Hermann, Wilhelm; and Horster, Horst, 4,091,793, Cl. 126-270.000.
Horvath, Istvan; Korospataky, Sandor; Rajki, Sandor; Tejfalussy, Andras; and Tischner, Tibor, to Magyar Tudomanyos Akademia Mezogazdasagi Kutato Intezete. Equipment for the investigation or optimization of the properties and raising methods of organisms. 4,091,566, Cl. 47-17.000.
Horwitz, Norman H. Tool sharpening fixture for a grinding tool. 4,091,574, Cl. 51-141.000.
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Nakaso, Tohru; Hosokawa, Manabu; Nomura, Kenzi; and Hikosaka, Tatsuya, 4,091,526, Cl. 29-568.000.

Houtermans, Antonius H. I.; and Kamphuis, Johannes G., to Oce-van der Grinten N.V. Photocopying materials. 4,092,170, Cl. 96-91.00R.
Howard, Donald Dunbar; and Schettler, Helmut, to International Business Machines Corporation. A.C. powered speed up circuit. 4,092,551, Cl. 307-254.000.
Howard, William M.: *See—*
Frederiksen, Thomas M.; Sleeth, Robert S.; and Howard, William M., 4,092,611, Cl. 330-261.000.
Howe, Frank D.; and Hoppe, Lee Max, to Ingersoll-Rand Company. Gas-entrained liquid separating means with dual housing. 4,092,137, Cl. 55-337.000.
Hoyer, Wilmer A., to Exxon Production Research Company. In situ process for recovery of carbonaceous materials from subterranean deposits. 4,091,869, Cl. 166-259.000.
Hoyt, Earl H., Jr. Take down bow with limb adjustment means. 4,091,790, Cl. 124-24.00R.
HPC, Inc.: *See—*
Schmanski, Donald W., 4,092,081, Cl. 404-10.000.
Hradek, Richard W.: *See—*
Tsang, Peter Hing-Shya; Hradek, Richard W.; and Bode, James Daniel, 4,092,264, Cl. 252-186.000.
Hrovat, Milan F., to Nukem GmbH. Block fuel element for gas-cooled high temperature reactors. 4,092,384, Cl. 264-.500.
Huber, William; Field, Nathan D.; Marder, Herman L.; and Cole, Raymond C., to International Playtex, Inc. Padded brassieres. 4,091,819, Cl. 128-479.000.
Huebner, John R.: *See—*
Edmunds, Robert H.; Huebner, John R.; Skurka, James A.; and Wilson, Francis B., 4,091,837, Cl. 137-341.000.
Huffman, Roger B., to Dana Corporation. Easily assembled and disassembled planetary gear assembly. 4,091,688, Cl. 74-785.000.
Huffman, Roger B., to Dana Corporation. Planetary steering hub assembly. 4,091,689, Cl. 74-785.000.
Huggins, John M., to Intel Corporation. MOS voltage controlled low-pass filter. 4,092,619, Cl. 333-70.00R.
Hughes Aircraft Company: *See—*
Davis, John M., Jr., 4,092,664, Cl. 357-80.000.
Harrington, John B., 4,092,603, Cl. 325-473.000.
Hershman, George H., 4,092,725, Cl. 364-826.000.
Moss, Gaylord E., 4,092,531, Cl. 250-216.000.
Prince, Paul R., 4,092,549, Cl. 307-221.00D.
Proud, William H., 4,092,645, Cl. 343-18.00E.
Hughes, George W. Device for selectively interrupting mechanical operation of a manually operated telephone. 4,092,500, Cl. 179-90.00D.
Hughes Steel Products Pty. Ltd.: *See—*
Hughes, William Felix, 4,092,014, Cl. 366-156.000.
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Humbert, Heiko; Fuchs, Gundolf; and Pirck, Dietrich, to Deutsche Texaco Aktiengesellschaft. Powder coating compositions. 4,092,298, Cl. 260-75.00T.
Hunsucker, Jerry Hoyt, to IMC Chemical Group, Inc. Method of controlling the growth of algae and viruses using members of the class of oxazolidines. 4,092,144, Cl. 71-67.000.
Hunt Manufacturing Co.: *See—*
Alexander, Robert L., 4,091,933, Cl. 211-204.000.
Hurtig, Roy E.; and Rojo, Stanley I., to Memorex Corporation. Magnetic recording member abrasion tester. 4,091,654, Cl. 73-7.000.
Huschka, Hans; and Herrmann, Franz Josef, to Nukem GmbH. Fuel element for high temperature reactors. 4,092,218, Cl. 176-84.000.
Hutchins, Alma A. Retention of abrasive sheet material on an abrading tool. 4,091,576, Cl. 51-170.0TL.
Hutchins, James Peyton, to Procter & Gamble Company, The. Drying process. 4,091,544, Cl. 34-9.000.
HydroTech International, Inc.: *See—*
Motes-Conners, Corroll J.; and Satterwhite, Lawrence E., 4,091,514, Cl. 29-33.00T.
Ichiki, Eiichi; Kida, Dazuo; Kamata, Satoshi; and Kobayashi, Yoshinori, to Sumitomo Chemical Company, Limited. Process for producing tetrachloroethylene from tetrachloromethane using a molten salt catalyst. 4,092,370, Cl. 260-658.00R.
Ideal Corporation: *See—*
Parrondo, Henry, 4,092,563, Cl. 315-200.00A.
Ihrig, Arthur Morton; and Williams, David Lynn, to Loews Theatres, Inc. Article for the selective removal of hydrogen cyanide from tobacco smoke. 4,091,822, Cl. 131-9.000.
Iijima, Yoshio: *See—*
Akiyama, Yasutaka; and Iijima, Yoshio, 4,091,515, Cl. 29-33.00M.
Ijlstra, Hendrik Jan: *See—*
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Ikeda, Akihiko: *See—*
Miyake, Tetsuya; Seko, Maomi; Takeda, Kunihiko; Ikeda, Akihiko; and Imamura, Kazuo, 4,092,398, Cl. 423-7.000.
Ikeuchi, Hiroshi. Spray nozzle. 4,092,003, Cl. 239-590.000.
Iles, Michael Victor: *See—*
Underwood, Michael John; Martin, Michael Joseph; and Iles, Michael Victor, 4,092,495, Cl. 179-1.0SM.
Illinois Tool Works Inc.: *See—*
Ruehl, William E., 4,091,762, Cl. 116-70.000.
Imai, Takeshi, to Nippondenso Co., Ltd. Resin-sealed electrical device. 4,092,487, Cl. 174-52.0PE.
Imamura, Kazuo: *See—*
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Imamura, Masashi: *See—*
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Imanaka, Hiroshi: *See—*
Aoki, Hatsuo; Nishiura, Toyozi; and Imanaka, Hiroshi, 4,092,411, Cl. 424-114.000.
Imatt, Alex: *See—*
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IMC Chemical Group, Inc.: *See—*
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Shipchandler, Mohammed T., 4,092,326, Cl. 260-307.00F.
Shipchandler, Mohammed T., 4,092,351, Cl. 260-521.00P.
Imperial Chemical Industries Limited: *See—*
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Plant, David William; and Williams, David John, 4,092,478, Cl. 544-76.000.
Remmington, Timothy Alan, 4,092,289, Cl. 260-40.00R.
Imperial Metal Industries (Kynoch) Limited: *See—*
Gordon, Stuart; and Evans, Geoffrey Ian, 4,092,186, Cl. 149-10.000.
In Situ Technology, Inc.: *See—*
Terry, Ruel Carlton, 4,092,052, Cl. 299-2.000.
Inamorato, Jack T.; and Chirash, William, to Colgate-Palmolive Company. Liquid detergent of controlled viscosity. 4,092,273, Cl. 252-548.000.
Ing. C. Olivetti & C., S.p.A.: *See—*
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Ingersoll-Rand Company: *See—*
Howe, Frank D.; and Hoppe, Lee Max, 4,092,137, Cl. 55-337.000.
Innami, Tatsuo: *See—*
Moriguchi, Seki; Innami, Tatsuo; Uno, Akira; Orikasa, Hiroki; and Sakaba, Toshihito, 4,091,981, Cl. 227-8.000.
Inoue, Hideo: *See—*
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Institut Francais du Petrole: *See—*
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Institut Francais du Petrole des Carburants et Lubrifiants and Societe Anonyme Pour Tous: *See—*
Capdevielle, Pierre; and Kermarrec, Francois, 4,091,952, Cl. 220-22.000.
Institute Po Metaloznanie I Technologia Na Metalite: *See—*
Balevski, Angel Tonchev; Nikolov, Ivan Dimov; Mateev, Evgeni Hristov; Trifonov, Todor Kostadinov; and Kojuharov, Vassil Vladimirov, 4,092,385, Cl. 264-45.500.
Instrument Services, Inc.: *See—*
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Intel Corporation: *See—*
Huggins, John M., 4,092,619, Cl. 333-70.00R.
Watrous, Willis G., Jr., 4,092,661, Cl. 357-23.000.
International Business Machines Corporation: *See—*
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Barclay, Donald John; Bird, Colin Leonard; Hallett, Michael Henry; Kirkman, David Horrobin, Minshull, John Francis; and Owen, Charles Edward, 4,092,637, Cl. 340-324.00R.
Beilstein, Kenneth Edward, Jr.; and Kotecha, Harish Narandas, 4,092,548, Cl. 307-205.000.
Dix, Gary Lee; Hanson, Charles Christian; Jahnke, Robin Charles; and King, Francis Kong, 4,092,681, Cl. 360-75.000.
Fang, Frank Fu; and Herrell, Dennis James, 4,092,553, Cl. 307-306.000.
Graham, John Earl, II, 4,091,978, Cl. 225-100.000.
Howard, Donald Dunbar; and Schettler, Helmut, 4,092,551, Cl. 307-254.000.
Olsen, Carlton Edward; and Serpa, Leroy Jasper, 4,092,166, Cl. 96-38.200.
Ouchi, Norman Ken, 4,092,732, Cl. 364-900.000.
Rosenbaum, Walter Steven; and Tanner, Howard Carl, 4,092,729, Cl. 364-900.000.
Spaight, Ronald Neil, 4,092,697, Cl. 361-386.000.
Stigliani, Daniel J., Jr., 4,092,061, Cl. 350-96.180.
International Computers Limited: *See—*
Richer, John Wilfred, 4,092,185, Cl. 148-175.000.
Underwood, Michael John; Martin, Michael Joseph; and Iles, Michael Victor, 4,092,495, Cl. 179-1.0SM.
International Flavors & Fragrances Inc.: *See—*
Mookherjee, Braja Dulal; Evers, William J.; and Goossens, Alfred E., 4,092,333, Cl. 260-347.200.
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International Harvester Company: *See—*
Dunhill, Geoffrey; and Halstead, Edgar R., 4,091,494, Cl. 15-250.160.
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McNaull, Tom M., 4,091,968, Cl. 222-282.000.
International Nickel Company, Inc., The: *See—*
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International Playtex, Inc.: *See—*
Huber, William; Field, Nathan D.; Marder, Herman L.; and Cole, Raymond C., 4,091,819, Cl. 128-479.000.
International Recycling Enterprises, Ltd.: *See—*
Baker, Albert B., 4,091,825, Cl. 134-2.000.
International Standard Electric Corporation: *See—*
Rothfuss, Hans, 4,092,651, Cl. 354-1.000.
Weir, Donald Adams; and Usher, Eric Stanley, 4,092,595, Cl. 325-38.00A.
International Telephone & Telegraph Corporation: *See—*
Majkrzak, Charles Peter; and Brennan, Vishno Edward, 4,092,484, Cl. 174-12.00R.
McCartney, Ronald L.; Hogan, Vaughn C.; Landgreen, Eleanor A.; and Bauerkemper, Michael I., 4,092,396, Cl. 264-249.000.
Place, Harry, 4,092,597, Cl. 325-53.000.
International Video Corporation: *See—*
Russell, Jerry C., Jr., 4,091,975, Cl. 224-5.00V.
Interpace Corporation: *See—*
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INTERx Research Corporation: *See—*
Kaminski, James J.; and Bodor, Nicolae S., 4,092,420, Cl. 424-263.000.
Inveresk Research International: *See—*
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Iona, Mario. Process for producing low density low-sulfur crude oil. 4,092,238, Cl. 208-80.000.
Ionov, Valentin Vasilievich: *See—*
Kostousov, Anatoly Ivanovich; Ionov, Valentin Vasilievich; Shakhbazyan, Vyacheslav Georgievich; and Terekhin, Vladimir Afanasievich, 4,091,714, Cl. 90-76.000.
Iplex Plastic Industries Pty. Ltd.: *See—*
Grosse, Barry J.; and Morley, Johann J., 4,092,002, Cl. 239-542.000.
Ipri, Alfred Charles, to RCA Corporation. Silicon implanted and bombarded with phosphorus ions. 4,092,209, Cl. 156-628.000.
Ishibashi, Satoshi: *See—*
Sueoka, Tetsuro; and Ishibashi, Satoshi, 4,092,703, Cl. 357-38.000.
Ishigami, Hiroyuki, to Otsuka Koki Co., Ltd. Ratchet type quick feeding mechanism for automobile pantograph jack. 4,092,012, Cl. 254-126.000.
Ishigami, Sumiyuki: *See—*
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Ishihara Sangyo Kaisha, Ltd.: *See—*
Takahashi, Ryohei; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; and Sakashita, Nobuyuki, 4,092,151, Cl. 71-94.000.
Ishikawa, Hitoshi; Yamamoto, Kimihiko; Sawada, Toshio; and Kasahara, Takahiko, to Aisin Seiki Kabushiki Kaisha. Thread winding mechanism for a sewing machine. 4,091,755, Cl. 112-279.000.
Ishikawa, Katsumi; and Ozawa, Akio, to Pioneer Electronic Corporation. Temperature sensing protection circuit for IC power chip having thermal hysteresis characteristic. 4,092,693, Cl. 361-103.000.
Ishikawa, Takehiro; and Koike, Yuji, to Kabushiki Kaisha Daini Seikosha. Digital electronic timepiece. 4,091,609, Cl. 58-23.00R.
Itek Corporation: *See—*
DiCiaccio, James J., 4,091,541, Cl. 33-125.00R.
Ebner, Peter R., 4,092,702, Cl. 354-15.000.
Ito, Fumio: *See—*
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Ito, Kenichi: *See—*
Arai, Shigeru; Ito, Kenichi; Ogawa, Kinya; Kurimoto, Kazuhiko; and Shirota, Yoshihiro, 4,092,471, Cl. 528-502.000.
Ito, Shojiro; Kobashi, Toshiyuki; Kitagawa, Yasuhiro; and Kunikata, Katsumi, to Japan Exlan Company, Limited; and Sumitomo Chemical Company, Limited. Process for producing stable emulsion of polymer. 4,092,287, Cl. 260-29.6RB.
Ito, Tadashi; Ito, Fumio; Mashimo, Yukio; Sakurado, Nobuaki; and Shinoda, Nobuhiko, to Canon Kabushiki Kaisha. Exposure information indicating device for a camera. 4,092,652, Cl. 354-23.00D.
Itoh, Toshiharu, to Kabshiki Kaisha Osaka Jidoki Seisakusho. Rotary capsule direction arranging and filling equipment. 4,091,600, Cl. 53-282.000.
ITT Industries, Incorporated: *See—*
Hoehn, Wolfgang, 4,092,552, Cl. 307-299.00A.
Iwasaki Tsushinki Kabushiki Kaisha: *See—*
Suzuki, Akihiko; and Takematsu, Hikaru, 4,092,501, Cl. 179-99.000.
Iwata, Shuzo: *See—*
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Izawa, Teruaki, to Nihon Hoso Kikai K.K. Binding apparatus for palletized loads. 4,091,723, Cl. 100-4.000.
Izawa, Tetsuo; Kajikawa, Shuji; Satomi, Koji; Nakano, Koichiro; Kurosawa, Shinichi; Hirai, Keitaro; and Tsukada, Yuichi, to Nippon Kokan Kabushiki Kaisha. Method for removing water and grease deposit from rolling mill sludge. 4,091,545, Cl. 34-9.000.
Jabs, Gert: *See—*
Reischl, Artur; Jabs, Gert; Dietrich, Werner; and Gonzalez-Dorner, Alberto Carlos, 4,092,275, Cl. 260-2.5BD.
Jackson, Arlyn H. Ocean motion power generating system. 4,091,618, Cl. 60-497.000.
Jackson, Jerome E.; and Blades, John D., to Addressograph-Multigraph Corp. Ion modulator having bias electrode for regulating control fields. 4,092,160, Cl. 96-1.00R.
Jackson, Jesse Milne, to Bell Telephone Laboratories, Incorporated. Heat detecting apparatus and method. 4,091,657, Cl. 73-40.000.
Jackson, William Lewis, to Dunlop Limited. Tire having annular reinforcing structure and compressed rubber hoop. 4,091,856, Cl. 152-361.00R.
Jacobs, Lawrence O'Quinn, to Plastic Products, Inc. Cable-suspended draw-curtain system. 4,091,857, Cl. 160-330.000.
Jacobs, Louis J., Jr.: *See—*
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Jacobsen, Alan Nicholas. Method and apparatus for the twisting of yarn. 4,091,605, Cl. 57-58.890.
Jacobson, Ralph Spencer. Screw. 4,091,708, Cl. 85-45.000.
Jacobsson, Kurt Arne Gunnar, to Aktiebolaget IRO. Thread storage and delivery device. 4,092,006, Cl. 242-47.010.
Jacquard Systems: *See—*
Bolton, Edgar A.; and Olson, Gust A., 4,091,910, Cl. 400-131.000.
Jaffe, Wolfgang: *See—*
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Zodrow, Rudolf, 4,092,207, Cl. 156-568.000.
Jager, Horst; and Rohringer, Peter, to Ciba-Geigy Corporation. Bromine substituted carboxylic acid esters. 4,092,337, Cl. 260-408.000.
Jahnke, Robin Charles: *See—*
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Janssoone, Marie-Michelle: *See—*
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Japan Aviation Electronics Industries Ltd.: *See—*
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Calkins, Thornton Ross; and Jaquiss, Donald Benjamin George, 4,092,288, Cl. 260-37.0PC.
Jasinski, Irving R. Wheel and control stick enabling turning and tilting thereof. 4,091,564, Cl. 46-220.000.
Jennison, William, to United Kingdom Atomic Energy Authority. Samplers. 4,091,675, Cl. 73-422.00R.
Jensen, Wayne Emil; and Stanfield, Charles Keith, to B. & J. Manufacturing Company. Tire rasp blade having multi-cutting edges. 4,091,516, Cl. 29-79.000.
Jergens, William F.: *See—*
Voigt, William C.; and Jergens, William F., 4,092,709, Cl. 363-18.000.
Jeumont-Schneider: *See—*
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Job, Allen R., to Domtar Inc. Ferro lime. 4,092,406, Cl. 423-594.000.
John Wyeth & Brother Limited: *See—*
Curran, Adrian Charles Ward, 4,092,317, Cl. 260-283.0SY.
Curran, Adrian Charles Ward, 4,092,320, Cl. 260-294.80C.
Curran, Adrian Charles Ward, 4,092,418, Cl. 424-256.000.
Johnson, Carl E.: *See—*
Bridwell, Billy W.; and Johnson, Carl E., 4,092,367, Cl. 568-785.000.
Johnson, Grover Lee: *See—*
Deffeyes, Robert J.; and Johnson, Grover Lee, 4,092,459, Cl. 428-403.000.
Johnson, Kenneth C., to F. J. Littell Machine Company. Method of uncoiling and straightening strip material. 4,091,649, Cl. 72-183.000.
Johnson, Larry R. Hanger wire bender. 4,091,845, Cl. 140-106.000.
Johnson, Ralph Edward; and Rodda, Donald, to Singer Company, The. Bobbin thread pull-off for lockstitch looptaker. 4,091,753, Cl. 112-184.000.
Jonda, Wolfgang, to Messerschmitt-Bolkow-Blohm GmbH. Lightweight structural part formed of carbon fiber-reinforced plastic. 4,092,453, Cl. 428-255.000.
Jones, Charles, to Curtiss-Wright Corporation. Stratified charge fuel injection system for rotary engine. 4,091,789, Cl. 123-205.000.
Jones, Charles L., to EnMail Machine Corporation. Method of and apparatus for manufacturing envelopes. 4,091,596, Cl. 53-31.000.
Jones, David A., Jr.; Schlatter, James M.; Mikulec, Richard A.; and Reuter, Judith A., to G. D. Searle & Co. 4-Substituted enkephalin derivatives. 4,092,304, Cl. 260-112.50R.
Jones, David L. Chance controlled counting game. 4,092,029, Cl. 273-271.000.
Jones, John B., Jr.: *See—*
Harris, Harry A.; and Jones, John B., Jr., 4,092,128, Cl. 48-197.00R.
Jones & Laughlin Steel Corporation: *See—*
Charpentier, Philippe L.; Goodenow, Robert H.; and Dennis, William E., 4,092,179, Cl. 148-2.000.
Jones, Rita Alberta: *See—*
Hartopp, George Albert, 4,091,786, Cl. 123-141.000.
Jones, Ronald B. Telephone attachment for plug-in headset capability. 4,092,502, Cl. 179-100.00R.
Jones, Thomas L. Speedometer scale conversion kit and method. 4,092,191, Cl. 156-64.000.
Jones, Trevor Eric, to Albright & Wilson Limited. Process for preparing organotin compounds. 4,092,340, Cl. 260-429.700.
Jordan, Charles P.; and McGuire, Claire L. Inflatable box. 4,091,852, Cl. 150-.500.

Jorgensen, Larry C. Manually operable crutch and cane stand. 4,091,828, Cl. 135-66.000.

Joseph E. Podgor, Inc.: *See—*
Walker, Howard R., 4,091,726, Cl. 101-38.00A.

Josglade Limited: *See—*
Leigh, Barry Rupert, 4,091,547, Cl. 34-86.000.

Joslin, Frederick R.; Palma, Gary E.; and Whitney, Gary L., to United Technologies Corporation. Laser method of precision hole drilling. 4,092,515, Cl. 219-121.0LM.

Jotterand, Armand, to Sandoz Ltd. Process for the synthesis of certain 2-amino-5-cyanothiophenes. 4,092,329, Cl. 260-329.0AM.

Jouffret, Michel: *See—*
Costantini, Michel; Dromard, Adrien; and Jouffret, Michel, 4,092,361, Cl. 260-586.00P.

JTX Systems, Inc.: *See—*
Teijeiro, Joseph M., 4,092,435, Cl. 426-296.000.

June, Malcolm Neville: *See—*
Padovani, Francois A.; Miller, Michael Brant; Moore, James A.; Fowler, James H.; June, Malcolm Neville; Matthews, James D.; Morton, T. R.; Stotko, Norbert A.; and Palmer, Lewis B., 4,092,446, Cl. 427-213.000.

Jung, Dieter: *See—*
Sperling, Gerhard; Jung, Dieter; Hachmann, Klaus; Schwuger, Milan Johann; and Smolka, Heinz, 4,092,261, Cl. 252-131.000.

Jurgensen, David James: *See—*
Rhodes, Charles Wesley; and Jurgensen, David James, 4,092,674, Cl. 358-186.000.

Kaberg, Bengt Sune: *See—*
Eriksson, Hans Edvin Ake; Kaberg, Bengt Sune; and Rehnovist, Nils Torsten, 4,092,224, Cl. 204-32.00R.

Kabshiki Kaisha Osaka Jidoki Seisakusho: *See—*
Itoh, Toshiharu, 4,091,600, Cl. 53-282.000.

Kabushiki Kaisha Aiki Shoji: *See—*
Nakagawa, Masashi, 4,092,093, Cl. 425-398.000.

Kabushiki Kaisha Daini Seikosha: *See—*
Fukuichi, Takuro, 4,091,611, Cl. 58-57.500.
Ishikawa, Takehiro; and Koike, Yuji, 4,091,609, Cl. 58-23.00R.

Kabushiki Kaisha Meidensha: *See—*
Sueoka, Tetsuro; and Ishibashi, Satoshi, 4,092,703, Cl. 357-38.000.

Kabushiki Kaisha Sato Kenkyusho: *See—*
Sato, Yo, 4,091,728, Cl. 101-288.000.

Kabushiki Kaisha Shikutani: *See—*
Akiyama, Satoshi, 4,091,538, Cl. 30-276.000.

Kabushiki Kaisha Suiken: *See—*
Sato, Toshiyuki; and Edo, Hideo, 4,092,036, Cl. 285-337.000.

Kabushiki Kaisha Takenaka Seisakusho: *See—*
Namikawa, Kosuke; Onoda, Hajime; Okamoto, Mineo; Fujii, Isamu; Matsuda, Takaaki; Uebayashi, Mustuo; and Suzuki, Hirosi, 4,091,668, Cl. 73-263.000.

Kaisaku, Yoshiro: *See—*
Shimizu, Kunitami; and Kaisaku, Yoshiro, 4,091,939, Cl. 214-16.40A.

Kajikawa, Shuji: *See—*
Izawa, Tetsuo; Kajikawa, Shuji; Satomi, Koji; Nakano, Koichiro; Kurosawa, Shinichi; Hirai, Keitaro; and Tsukada, Yuichi, 4,091,545, Cl. 34-9.000.

Kallianos, Andrew George; Southwick, Everett West; and Simpson, Melvyn Irving, to Liggett Group Inc. Cyclogeraniol and derivatives thereof as tobacco flavorants. 4,091,823, Cl. 131-17.00R.

Kalt Manufacturing Company: *See—*
Kalt, William E., 4,091,486, Cl. 10-11.00E.

Kalt, William E., to Kalt Manufacturing Company. Punch knock-out mechanism for header. 4,091,486, Cl. 10-11.00E.

Kalvoda, Jaroslav: *See—*
Biollaz, Michel; and Kalvoda, Jaroslav, 4,092,310, Cl. 260-239.55D.

Kamata, Satoshi: *See—*
Ichiki, Eiichi; Kida, Dazuo; Kamata, Satoshi; and Kobayashi, Yoshinori, 4,092,370, Cl. 260-658.00R.

Kamejima, Taibun: *See—*
Sakuma, Isamu; Yonezu, Hiroo; Nishida, Katsuhiko; Kamejima, Taibun; Yuasa, Tonao; Ueno, Masayasu; Uji, Toshio; Nannichi, Yasuo; and Hayashi, Izuo, 4,092,614, Cl. 331-94.50P.

Kaminaka, Nobuyuki: *See—*
Nomura, Noboru; Kanai, Kenji; Kaminaka, Nobuyuki; and Nouchi, Norimoto, 4,092,688, Cl. 360-121.000.

Kaminski, James J.; and Bodor, Nicolae S., to INTERx Research Corporation. Novel soft N-chloroamino alcohol derivatives exhibiting antibacterial activity. 4,092,420, Cl. 424-263.000.

Kamiya, Kunio; Yusa, Hideo; and Tsuchiya, Hiroyuki, to Hitachi, Ltd. Process and apparatus for treating a waste gas including combustible gases and radioactive Kr-85. 4,092,133, Cl. 55-62.000.

Kamiya, Minoru. Stratified combustion type engine. 4,091,774, Cl. 123-32.0ST.

Kamphuis, Johannes G.: *See—*
Houtermans, Antonius H. I.; and Kamphuis, Johannes G., 4,092,170, Cl. 96-91.00R.

Kamyr Aktiebolag: *See—*
Richter, Johan C. F. C.; and Richter, Ole Johan, 4,092,212, Cl. 162-19.000.

Kanai, Kenji: *See—*
Nomura, Noboru; Kanai, Kenji; Kaminaka, Nobuyuki; and Nouchi, Norimoto, 4,092,688, Cl. 360-121.000.

Kansai Paint Co., Ltd.: *See—*
Higuchi, Tetsuo, 4,092,172, Cl. 96-115.00P.

Kanzaki Paper Manufacturing Co., Ltd.: *See—*
Fujita, Seigoro; and Kitahori, Tojiro, 4,092,457, Cl. 428-341.000.

Kao, Jar-Lin: *See—*
Leonard, John Joseph; and Kao, Jar-Lin, 4,092,355, Cl. 260-530.00N.

Kao Soap Co., Ltd.: *See—*
Nishimura, Masaaki; and Arai, Haruhiko, 4,092,272, Cl. 252-545.000.
Takamori, Shigeru; Yamashita, Kazutaka; and Kono, Yoshinao, 4,092,295, Cl. 260-47.0EA.

Kaplan, Earl: *See—*
Pinto, Frank George; and Kaplan, Earl, 4,092,455, Cl. 428-295.000.

Kaplan, Leonard Abraham, to RCA Corporation. Circuit for reducing ripple voltage. 4,092,609, Cl. 330-149.000.

Karasiewicz, Czeslaw; and Seliborski, Janusz, to Kombinat Maszyn Budowlanych "Bumar" Warszawskie Zaklady Maszyn Budowlanych IM.L. Warynskiego. Reamer for fine reaming of ports. 4,091,525, Cl. 407-1.000.

Karl Lautenschlager KG Mobelbeschlagfabrik: *See—*
Lautenschlager, Gerhard Wilhelm, 4,091,500, Cl. 16-145.000.
Lautenschlager, Karl, 4,091,499, Cl. 16-129.000.
Lautenschlager, Karl; and Lautenschlager, Gerhard, 4,091,501, Cl. 16-166.000.
Lautenschlager, Reinhard, 4,091,498, Cl. 16-128.00R.

Karlin, Richard A., to Sun Electric Corporation. Dwell measuring apparatus. 4,092,584, Cl. 324-16.00R.

Karrer, Friedrich: *See—*
Farooq, Saleem; and Karrer, Friedrich, 4,092,365, Cl. 260-613.00R.

Kasahara, Jyunkichi: *See—*
Tamura, Takashi; Matsuzaki, Tsuneo; Kasahara, Jyunkichi; and Nakamura, Ken, 4,091,673, Cl. 73-351.000.

Kasahara, Takahiko: *See—*
Ishikawa, Hitoshi; Yamamoto, Kimihiko; Sawada, Toshio; and Kasahara, Takahiko, 4,091,755, Cl. 112-279.000.

Kataoka, Seiji; Shimizu, Tutomu; and Katwuno, Kesao, to Nippon Steel Corporation. Top dust collecting apparatus in coke quenching system. 4,092,222, Cl. 202-227.000.

Kataoka, Shigeyuki: *See—*
Mori, Takashi; Takaku, Sakae; Oi, Nobuhiro; Shindo, Minoru; Hirano, Takeaki; Kataoka, Shigeyuki; and Furuno, Kouji, 4,092,431, Cl. 424-324.000.

Katoh, Hiroshi: *See—*
Onoe, Yasumitsu; Matsumura, Yoshikazu; Katoh, Hiroshi; Nakajima, Koe; and Sekino, Shozo, 4,092,178, Cl. 148-2.000.

Katsenes, Philip K. Trigger sequencer for twin barrel guns. 4,091,556, Cl. 42-42.00R.

Katwuno, Kesao: *See—*
Kataoka, Seiji; Shimizu, Tutomu; and Katwuno, Kesao, 4,092,222, Cl. 202-227.000.

Katz, Ira: *See—*
Mookherjee, Braja Dulal; Withycombe, Donald Arthur; Katz, Ira; Goossens, Alfred E.; Vock, Manfred Hugo; Evers, William John; Vinals, Joaquin F.; and Kiwala, Jacob, 4,092,334, Cl. 260-347.200.

Kaufholz, Frank H., Jr., to Computer Peripherals, Inc. Cartridge ejecting mechanism. 4,092,689, Cl. 360-137.000.

Kaufman, Sydney M., to Ford Motor Company. Copper coated, iron-carbon eutectic alloy powders. 4,092,223, Cl. 204-23.000.

Kawahara, Shigemi: *See—*
Murakami, Masuo; Kawahara, Shigemi; Kawata, Hiroitsu; Okazaki, Kiyoshi; Sekino, Jun; and Shimizu, Hidemi, 4,092,428, Cl. 424-317.000.

Kawai, Yoshihisa, to Minolta Camera Kabushiki Kaisha. Projection device for use in copying machine. 4,092,066, Cl. 355-67.000.

Kawasaki, Masahiro; Tano, Eiichi; and Sawada, Yoshio, to Asahi Kogaku Kogyo Kabushiki Kaisha. Mirror movement disable circuit for LED display in light finder of SLR camera. 4,092,653, Cl. 354-60.00L.

Kawata, Hiroitsu: *See—*
Murakami, Masuo; Kawahara, Shigemi; Kawata, Hiroitsu; Okazaki, Kiyoshi; Sekino, Jun; and Shimizu, Hidemi, 4,092,428, Cl. 424-317.000.

Kay, Peter Lawrence: *See—*
Boesen, George Francis; and Kay, Peter Lawrence, 4,092,696, Cl. 361-283.000.

Kearn, Ronald. Hockey garment. 4,091,466, Cl. 2-23.000.

Keller, Frank R.: *See—*
Rundel, Morton Stanley; and Keller, Frank R., 4,092,508, Cl. 200-291.000.

Kelley Company Inc.: *See—*
Artzberger, Thomas G., 4,091,488, Cl. 14-71.700.

Kelley, Jay Hilary. Prestressed elastic arched mine roof support. 4,091,628, Cl. 61-45.00C.

KemaNord AB: *See—*
Bjorklund, Christer James Axel; and Reuterhall, Alf Ragnar, 4,092,432, Cl. 424-326.000.

Kendall Company, The: *See—*
Egler, Vernon C., 4,091,922, Cl. 206-364.000.
Hasty, James H., 4,091,804, Cl. 128-24.00R.

Kennedy, Henry J. Radius milling or grinding tool actuator or controller. 4,091,713, Cl. 90-15.00A.

Kennedy, John R.: *See—*
Heater, William R.; Schaub, Fred S.; and Kennedy, John R., 4,091,772, Cl. 123-32.0SP.

Kent Corporation: *See—*
Weatherby, Robert G.; and Costello, Anthony C., 4,092,007, Cl. 242-55.000.

Kermarrec, Francois: *See*—
Capdevielle, Pierre; and Kermarrec, Francois, 4,091,952, Cl. 220-22.000.
Kerr-McGee Corporation: *See*—
Reed, Homer Charles, 4,092,237, Cl. 208-11.00R.
Kesten, Stephen J.: *See*—
Sircar, Jagadish C.; Kesten, Stephen J.; and Zinnes, Harold, 4,092,325, Cl. 260-307.00H.
Khutoretsky, Garri Mikhailovich; Zverev, Anatoly Timofeevich; Belova, Tamara Nikolaevna; Bazarov, Jury Alexeevich; and Gurevich, Elrikh Iosifovich. Method of electric machine assembly. 4,091,528, Cl. 29-596.000.
Kida, Dazuo: *See*—
Ichiki, Eiichi; Kida, Dazuo; Kamata, Satoshi; and Kobayashi, Yoshinori, 4,092,370, Cl. 260-658.00R.
Kikuchi, Yosio, to Nipponkai Heavy Industries Co., Ltd. Electric dust precipitator and scraper. 4,092,134, Cl. 55-109.000.
Kilichowski, Kurt B., to GTE Laboratories Incorporated. Cathode ray tube having amorphous resistive film on internal surfaces and method of forming the film. 4,092,444, Cl. 427-64.000.
Kilner, George Earl: *See*—
Pelster, Edwin Joseph; Kipers, Richard Franc; and Kilner, George Earl, 4,091,595, Cl. 53-14.000.
Kim, Han J.: *See*—
Reid, F. Joseph; and Kim, Han J., 4,092,157, Cl. 75-206.000.
Kim, Hyogun: *See*—
Halpern, Gerald M.; and Kim, Hyogun, 4,092,381, Cl. 264-15.000.
Kimball, James F. Line attachment device. 4,092,075, Cl. 403-72.000.
Kimbrough, James Alvin. Article of furniture. 4,091,746, Cl. 108-153.000.
Kimmon Manufacturing Co., Ltd.: *See*—
Namikawa, Kosuke; Onoda, Hajime; Okamoto, Mineo; Fujii, Isamu; Matsuda, Takaaki; Uebayashi, Mustuo; and Suzuki, Hirosi, 4,091,668, Cl. 73-263.000.
Kimura, Chiyuki, to Okuma Seisakusho Co. Ltd. Traveling road system of a toy. 4,091,561, Cl. 46-1.00K.
Kimura, Chiyuki, to Okuma Seisakusho Co. Ltd. Toy railway system. 4,091,562, Cl. 46-44.000.
Kimura, Katsuhiko: *See*—
Tsuda, Hiroshi; Nishikawa, Masaji; Kimura, Katsuhiko; and Sato, Eiichi, 4,092,065, Cl. 355-8.000.
Kinaga, Eiichi: *See*—
Yamada, Makoto; and Kinaga, Eiichi, 4,091,508, Cl. 24-171.000.
Kindel, Georg: *See*—
Klotz, Werner; and Kindel, Georg, 4,092,078, Cl. 403-221.000.
King, Francis Kong: *See*—
Dix, Gary Lee; Hanson, Charles Christian; Jahnke, Robin Charles; and King, Francis Kong, 4,092,681, Cl. 360-75.000.
Kinoshita, Tomoo, to Nihon Repro Machine Kogyo Kabushiki Kaisha. Device for dealing with the scraps of foamed thermoplastic synthetic resins. 4,091,967, Cl. 222-238.000.
Kinzel, Augustus B. Locking arrangement for jewelry and the like. 4,091,510, Cl. 24-230.00R.
Kipers, Richard Franc: *See*—
Pelster, Edwin Joseph; Kipers, Richard Franc; and Kilner, George Earl, 4,091,595, Cl. 53-14.000.
Kirkman, David Horrobin: *See*—
Barclay, Donald John; Bird, Colin Leonard; Hallett, Michael Henry; Kirkman, David Horrobin; Minshull, John Francis; and Owen, Charles Edward, 4,092,637, Cl. 340-324.00R.
Kirkup, Joseph F., to Mechanical Products. Circuit breaker. 4,092,623, Cl. 337-66.000.
Kishiwada, Susumu: *See*—
Shiraishi, Tatsuo; Kishiwada, Susumu; and Nagaoka, Yoshihiko, 4,092,354, Cl. 260-530.00N.
Kitagawa, Yasuhiro: *See*—
Ito, Shojiro; Kobashi, Toshiyuki; Kitagawa, Yasuhiro; and Kunikata, Katsumi, 4,092,287, Cl. 260-29.6RB.
Kitahori, Tojiro: *See*—
Fujita, Seigoro; and Kitahori, Tojiro, 4,092,457, Cl. 428-341.000.
Kitano, Takashi: *See*—
Oishi, Toshio; Kitano, Takashi; Sasaki, Hiroshi; and Yamashita, Tetuo, 4,092,283, Cl. 260-27.0BB.
Kitazato, Kenji: *See*—
Yasumoto, Mitugi; Yamashita, Junichi; Yamawaki, Ichiro; Unemi, Norio; Kitazato, Kenji; Hashimoto, Sadao; and Fujii, Setsuro, 4,092,313, Cl. 544-313.000.
Kittag, Gerd, to Vockenhuber, Karl; and Hauser, Raimund. Signal device for electro-acoustic reproducing equipment. 4,092,062, Cl. 352-170.000.
Kiuchi, Mitsuyuki; Mizukawa, Takumi; Kominami, Hideyuki; and Amagami, Keizo, to Matsushita Electric Industrial Co., Limited. Multiple-load induction heating cooking apparatus with means for eliminating interference between two or more commutation circuits. 4,092,510, Cl. 219-10.49R.
Kiwala, Jacob: *See*—
Mookherjee, Braja Dulal; Withycombe, Donald Arthur; Katz, Ira; Goossens, Alfred E.; Vock, Manfred Hugo; Evers, William John; Vinals, Joaquin F.; and Kiwala, Jacob, 4,092,334, Cl. 260-347.200.
Kjolsrud, Birger. Apparatus for attaching roof insulating sheets and similar objects. 4,091,850, Cl. 144-32.00R.
Kliphuis, Jans: *See*—
Dickinson, Robert V. C.; Entenman, Alan W.; and Kliphuis, Jans, 4,092,596, Cl. 325-49.000.
Klotz, Werner; and Kindel, Georg, to Lemforder Metallwaren AG. Elastic connection for an axial joint with connecting linkage of a motor vehicle steering gear. 4,092,078, Cl. 403-221.000.
Kluge, Herman Carl, II: *See*—
Agnihotri, Ram Kumar; and Kluge, Herman Carl, II, 4,092,442, Cl. 427-41.000.
Klutchko, Sylvester; and von Strandtmann, Max, to Warner-Lambert Company. 1-Benzoxepino[4,3-c]pyridines. 4,092,322, Cl. 260-294.900.
Knauseder, Franz: *See*—
Brandl, Ernst; Knauseder, Franz; and Rembold, Franz, 4,092,424, Cl. 424-299.000.
Kneale, Peter James, personal representative: *See*—
Dowty, George Herbert, deceased; Lilley, Virginia Anne, personal representative; Barber, Lionel, personal representative; and Kneale, Peter James, personal representative, 4,091,838, Cl. 137-528.000.
Knecht, William A.; and Zajac, Chester J., to Robertshaw Controls Company. Time variable thermostat. 4,091,993, Cl. 236-46.00R.
Knoche, Hubert: *See*—
Chapelet, Gilbert; Knoche, Hubert; and Marie, Gilbert, 4,092,255, Cl. 252-50.000.
Knop, Hans-Georg, to Dr. Ing. Rudolf Hell GmbH. Correction circuit for a color scanner. 4,092,668, Cl. 358-80.000.
Knothe, Erich; Berg, Christoph; and Stadler, Eberhard, to Sartorius-Werke GmbH. Compensating force-measuring or weighing device. 4,091,886, Cl. 177-210.0EM.
Kobashi, Toshiyuki: *See*—
Ito, Shojiro; Kobashi, Toshiyuki; Kitagawa, Yasuhiro; and Kunikata, Katsumi, 4,092,287, Cl. 260-29.6RB.
Kobayashi, Akio; Yaguchi, Kunihide; and Takaiwa, Masakazu, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method for removing sulfur dioxide from exhaust gas. 4,092,402, Cl. 423-243.000.
Kobayashi, Akira, deceased: *See*—
Sano, Takezo; Murase, Ichiki; Kobayashi, Akira, deceased; Kobayashi, Shuko, successor; and Kobayashi, Tsutomu, guardian, 4,092,250, Cl. 210-500.00M.
Kobayashi, Atsuo: *See*—
Furuoya, Itsuo; Kobayashi, Atsuo; and Ogino, Katsuhiko, 4,092,372, Cl. 260-681.000.
Kobayashi, Shinichi: *See*—
Hayashi, Yukichi; Tamura, Masayuki; Sugimoto, Osamu; Kobayashi, Shinichi; and Tanaka, Masanori, 4,091,908, Cl. 194-100.00A.
Kobayashi, Shuko, successor: *See*—
Sano, Takezo; Murase, Ichiki; Kobayashi, Akira, deceased; Kobayashi, Shuko, successor; and Kobayashi, Tsutomu, guardian, 4,092,250, Cl. 210-500.00M.
Kobayashi, Tsutomu, guardian: *See*—
Sano, Takezo; Murase, Ichiki; Kobayashi, Akira, deceased; Kobayashi, Shuko, successor; and Kobayashi, Tsutomu, guardian, 4,092,250, Cl. 210-500.00M.
Kobayashi, Yoshinobu. Process for preparing titanium carbide base powder for cemented carbide alloys. 4,092,156, Cl. 75-203.000.
Kobayashi, Yoshinori: *See*—
Ichiki, Eiichi; Kida, Dazuo; Kamata, Satoshi; and Kobayashi, Yoshinori, 4,092,370, Cl. 260-658.00R.
Koch, Klaus, to Paul Troester Maschinenfabrik. Extruder screw. 4,092,015, Cl. 366-81.000.
Kocks, Friedrich, deceased; and by Kocks, Jutta, heir, to Bindernagel, Ali. Process for producing pipe blooms. 4,091,524, Cl. 29-527.700.
Kocks, Jutta, heir: *See*—
Kocks, Friedrich, deceased; and Kocks, Jutta, heir, 4,091,524, Cl. 29-527.700.
Kodama, Takuya: *See*—
Miura, Koji; Takeshima, Kenjun; Kodama, Takuya; Imamura, Masashi; Hongo, Kyoko; Takagawa, Noboru; Hamatani, Yukitaka; and Suzuki, Yasuyuki, 4,092,350, Cl. 260-521.00R.
Koehler-Dayton, Inc.: *See*—
Lamb, Richard C., 4,092,248, Cl. 210-152.000.
Koester, Richard H., to Singer Company, The. Filmstrip projector. 4,092,063, Cl. 353-71.000.
Koike, Yuji: *See*—
Ishikawa, Takehiro; and Koike, Yuji, 4,091,609, Cl. 58-23.00R.
Koiler, Semen Nusievich: *See*—
Goldring, Grigory Mikhailovich; Koiler, Semen Nusievich; Losev, Vladimir Fedorovich; Pepenko, Vladimir Danilovich; Platov, Evgeny Ivanovich; Rabinovich, Benedikt Veniaminovich; and Sakhanovich, Jury Viktorovich, 4,091,858, Cl. 164-212.000.
Koji, Tetsu: *See*—
Tsuzuki, Naobumi; Koji, Tetsu; and Noguchi, Kazuo, 4,092,445, Cl. 427-85.000.
Kojuharov, Vassil Vladimirov: *See*—
Balevski, Angel Tonchev; Nikolov, Ivan Dimov; Mateev, Evgeni Hristov; Trifonov, Todor Kostadinov; and Kojuharov, Vassil Vladimirov, 4,092,385, Cl. 264-45.500.
Kombinat Maszyn Budowlanych "Bumar" Warszawskie Zaklady Maszyn Budowlanych IM.L. Warynskiego: *See*—
Karasiewicz, Czeslaw; and Seliborski, Janusz, 4,091,525, Cl. 407-1.000.
Kominami, Hideyuki: *See*—
Kiuchi, Mitsuyuki; Mizukawa, Takumi; Kominami, Hideyuki; and Amagami, Keizo, 4,092,510, Cl. 219-10.49R.
Komiyama, Yoshizo; Nakamura, Hiromi; and Abe, Hiroaki, to Toshiba Kikai Kabushiki Kaisha. Pump with porus ceramic tube. 4,091,970, Cl. 222-596.000.
Kondo, Kiyoshi; Matsui, Kiyohide; Negishi, Akira; and Takahatake, Yuriko, to Sagami Chemical Research Center. Process for preparing 6,6,6-trihalo-3,3-dimethyl-4-hexenoates. 4,092,482, Cl. 560-213.000.

Koniger, Max: *See—*
Mayr, Alois; Koniger, Max; and Obermayer, Gustav, 4,092,422, Cl. 424-270.000.

Konishiroku Photo Industry Co. Ltd.: *See—*
Tamura, Takashi; Matsuzaki, Tsuneo; Kasahara, Jyunkichi; and Nakamura, Ken, 4,091,673, Cl. 73-351.000.

Kono, Yoshinao: *See—*
Takamori, Shigeru; Yamashita, Kazutaka; and Kono, Yoshinao, 4,092,295, Cl. 260-47.0EA.

Kornylak Corporation: *See—*
Tabler, Charles P., 4,091,907, Cl. 193-35.00A.

Korospataky, Sandor: *See—*
Horvath, Istvan; Korospataky, Sandor; Rajki, Sandor; Tejfalussy, Andras; and Tischner, Tibor, 4,091,566, Cl. 47-17.000.

Korzon, Edward S., to Dura Plastics of New York, Inc. Knockdown self-supporting picture frame device. 4,091,555, Cl. 40-152.100.

Kostousov, Anatoly Ivanovich; Ionov, Valentin Vasilievich; Shakhbazyan, Vyacheslav Georgievich; and Terekhin, Vladimir Afanasievich. Broaching machine. 4,091,714, Cl. 90-76.000.

Kostyrkin, Boris Vladimirovich; and Schekin, Vladimir Ivanovich. Apparatus for stripping foundry moulds of casting. 4,091,859, Cl. 164-250.000.

Kotaka, Yasumasa, to AMP Incorporated. Electrical slide switch with self-centering flexible contact. 4,092,504, Cl. 200-16.00D.

Kotecha, Harish Narandas: *See—*
Beilstein, Kenneth Edward, Jr.; and Kotecha, Harish Narandas, 4,092,548, Cl. 307-205.000.

Koutsky, L. John, to Sears Manufacturing Company. Height adjuster for a vehicle seat. 4,092,009, Cl. 248-421.000.

Koyama, Mitsuo: *See—*
Onda, Eiichi; Koyama, Mitsuo; and Nakagawa, Tadashi, 4,092,657, Cl. 354-234.000.

Kozai, Teruo; Ohara, Shigeharu; Suzuki, Hiroshi; and Yanagihara, Shingo, to Nippon Electric Co., Ltd. Apparatus for washing semiconductor wafers. 4,092,176, Cl. 134-186.000.

Kozlowski, Eugene C.; and Stout, Charles A., to Diversified Chemical Corporation. Method of treating oil wells. 4,091,868, Cl. 166-250.000.

Kracht, Wolfgang: *See—*
Bocker, Ernst; Kracht, Wolfgang; Rupp, Roland; Schellmann, Erhard; Trescher, Viktor; and Ullrich, Martin, 4,092,089, Cl. 425-10.000.

Kraeft, Robert W.; and Lloyd, John B. Truck-mounted cable reel handling apparatus. 4,091,946, Cl. 214-518.000.

Kraemer, Arnum E.: *See—*
Martwick, Wilford E.; Ullrich, John P.; and Kraemer, Arnum E., 4,091,735, Cl. 102-79.000.

Kraft, Robert E.: *See—*
Hehmann, Horst W. W.; and Kraft, Robert E., 4,091,892, Cl. 181-286.000.

Kraftwerk Union Aktiengesellschaft: *See—*
Mutzl, Josef, 4,092,215, Cl. 176-38.000.
Neidl, Herbert, 4,092,541, Cl. 250-364.000.
Schabert, Hans-Peter; and Laurer, Erwin, 4,092,214, Cl. 176-38.000.
Schabert, Hans-Peter; and Drossel, Rolf, 4,092,490, Cl. 176-38.000.

Krane, Bruce E. Ice cream container. 4,091,929, Cl. 206-602.000.

Kratz, Bernhard; and Potthof, Erwin, to DIEHL, Firma. Timer clock. 4,091,608, Cl. 58-22.900.

Krekeler, Hans: *See—*
Fernholz, Hans; Krekeler, Hans; Schmidt, Hans-Joachim; and Wunder, Friedrich, 4,092,267, Cl. 252-413.000.

Kressel, Henry: *See—*
Lockwood, Harry Francis; and Kressel, Henry, 4,092,561, Cl. 313-499.000.

Kroposki, Lorraine M.; and Yoshimine, Masao, to Dow Chemical Company, The. Process for preparing phosphorothioates and phenylphosphonothioates. 4,092,312, Cl. 544-243.000.

Krueger, Kenneth A.; and Meyer, Daniel R., to Forage King Industries, Inc. Forage wagon apparatus. 4,091,972, Cl. 222-627.000.

Ku, Joseph P.; Matin, Fereidoon; and Trezise, Richard D., to Xerox Corporation. Printing apparatus with printing material non-motion detector. 4,091,913, Cl. 400-124.000.

Kubota, Ltd.: *See—*
Nemoto, Yukiyasu; and Nanba, Kyosuke, 4,091,630, Cl. 61-72.700.
Shingaki, Masamitsu; Umemoto, Tomeo; Sato, Mitsuhiro; and Yuki, Mikio, 4,091,685, Cl. 74-331.000.

Kumasaka, Isao, to Fuji Photo Film Co., Ltd. Anodized aluminum photographic plates with silver bromide in pores of oxide layer, and process of manufacture thereof. 4,092,169, Cl. 96-86.00R.

Kummer, Frederick J., to Abcor, Inc. Helically wound blood filter. 4,092,246, Cl. 210-65.000.

Kunikata, Katsumi: *See—*
Ito, Shojiro; Kobashi, Toshiyuki; Kitagawa, Yasuhiro; and Kunikata, Katsumi, 4,092,287, Cl. 260-29.6RB.

Kunz, Paul. Apparatus for steam peeling produce. 4,091,722, Cl. 99-479.000.

Kurata, Noboru; and Yamamoto, Kuniyuki, to Honda Giken Kogyo Kabushiki Kaisha. Power unit for a motor cycle. 4,091,887, Cl. 180-33.00A.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Kobayashi, Akio; Yaguchi, Kunihide; and Takaiwa, Masakazu, 4,092,402, Cl. 423-243.000.

Kurimoto, Kazuhiko: *See—*
Arai, Shigeru; Ito, Kenichi; Ogawa, Kinya; Kurimoto, Kazuhiko; and Shirota, Yoshihiro, 4,092,471, Cl. 528-502.000.

Kuroda, Hiroshi: *See—*
Hayashi, Yoshimasa; Kuroda, Hiroshi; Nakajima, Yasuo; and Yoshimura, Tooru, 4,091,615, Cl. 60-274.000.

Kurosawa, Shinichi: *See—*
Izawa, Tetsuo; Kajikawa, Shuji; Satomi, Koji; Nakano, Koichiro; Kurosawa, Shinichi; Hirai, Keitaro; and Tsukada, Yuichi, 4,091,545, Cl. 34-9.000.

Kyberna GmbH: *See—*
Frank, Gunter, 4,091,787, Cl. 123-148.00E.

Laauwe, Robert H. Squeeze bottle containing a powdered product and operative whether upright or inverted. 4,091,966, Cl. 222-211.000.

Labelette Company: *See—*
Wesley, James G., 4,092,204, Cl. 156-481.000.

Labofina S. A.: *See—*
Bertrand, Jean-Noel Marie, 4,092,281, Cl. 260-23.00H.

Lagasse, Normand L.; and Cuny, Richard P., to Avco Corporation. Torque indicating device. 4,091,663, Cl. 73-136.00R.

La Gatta, Dominick, to Commanche Engineering Corp. Sewage treatment device. 4,092,249, Cl. 210-195.00S.

Lain, Victor Y.: *See—*
Yee, Werner; and Lain, Victor Y., 4,092,599, Cl. 325-55.000.

Laing, Nikolaus; Schaper, Peter; and Heierli, Werner. Process for the treatment of metal surfaces by electro-deposition of metal coatings at high current densities. 4,092,226, Cl. 204-51.000.

Laitram Corporation, The: *See—*
Lapeyre, James M., 4,091,543, Cl. 33-356.000.

Lakra, Paul: *See—*
Seilly, Alec Harry; and Lakra, Paul, 4,091,784, Cl. 123-139.0AT.

Laky, Tibor: *See—*
Shannon, Frederick E., Jr.; and Laky, Tibor, 4,091,867, Cl. 166-77.000.

Lamb, Richard C., to Koehler-Dayton, Inc. Pump-filter assembly. 4,092,248, Cl. 210-152.000.

Lampman, DeWitt W.: *See—*
Frank, Robert G.; and Lampman, DeWitt W., 4,092,141, Cl. 65-114.000.

Landgreen, Eleanor A.: *See—*
McCartney, Ronald L.; Hogan, Vaughn C.; Landgreen, Eleanor A.; and Bauerkemper, Michael I., 4,092,396, Cl. 264-249.000.

Landry, Archie C.; and Daswick, Alexander C., to Daswick, Alexander C. Chair universally adjustable by occupant reclining therein, and method. 4,092,041, Cl. 297-68.000.

Landry, Jean-Marc: *See—*
Desrosiers, Wilfrid; and Landry, Jean-Marc, 4,091,496, Cl. 15-371.000.

Laneau, Gilbert, to Jeumont-Schneider. Connection network for PCM TDM automatic telephone exchange equipment. 4,092,497, Cl. 179-15.0AT.

Lang, James R., to Mechanex Corporation, The. Automatic oil level maintaining system. 4,091,894, Cl. 184-103.00R.

Lang, James R., to Mechanex Corporation, The. Oil level sensing apparatus. 4,091,895, Cl. 184-103.00R.

Lang, Rudolf; and Schwarz, Gerhard, to Carl Zeiss Stiftung. Photographic camera with interchangeable lens. 4,092,656, Cl. 354-202.000.

Langford, Obie M.; and Peelman, Harold E., to Texaco Inc. Means and method for controlling the neutron output of a neutron generator tube. 4,092,545, Cl. 250-501.000.

Lansing Research Corporation: *See—*
Smithline, Leonard M., 4,092,070, Cl. 356-106.00S.

Lapeyre, James M., to Laitram Corporation, The. Automatic magnetic compass correction. 4,091,543, Cl. 33-356.000.

Laprade, Bernard R.; Laprade, Xavier J.; and Gele, Pierre J. Device for the regulation of the fuel-air mixture of an internal combustion engine. 4,091,783, Cl. 123-124.00B.

Laprade, Xavier J.: *See—*
Laprade, Bernard R.; Laprade, Xavier J.; and Gele, Pierre J., 4,091,783, Cl. 123-124.00B.

Larrabee, Edward Whittum, to Union Carbide Corporation. Protective shielding assembly for use in loading a hypodermic syringe with radioactive material. 4,092,546, Cl. 250-515.000.

Larry, George A., to Star Cutter Company. Gun drill. 4,092,083, Cl. 408-59.000.

Larsen, Otis M. Flexible tube clamp. 4,091,815, Cl. 128-325.000.

La Salle, Stanley G.: *See—*
Beneker, Claus; and La Salle, Stanley G., 4,091,841, Cl. 138-89.000.

Laser Technique S.A.: *See—*
Merard, Rene Remy, 4,092,518, Cl. 219-121.0LM.

Lauffer, Donald K., to NCR Corporation. Frequency multiplier and level detector. 4,092,550, Cl. 307-229.000.

Laurel Bank Machine Co., Ltd.: *See—*
Ohsako, Kyoichi; and Oyama, Katsuyoshi, 4,092,533, Cl. 250-231.0SE.

Laurer, Erwin: *See—*
Schabert, Hans-Peter; and Laurer, Erwin, 4,092,214, Cl. 176-38.000.

Lautenschlager, Gerhard: *See—*
Lautenschlager, Karl; and Lautenschlager, Gerhard, 4,091,501, Cl. 16-166.000.

Lautenschlager, Gerhard Wilhelm, to Karl Lautenschlager KG Mobelbeschlagfabrik. Cabinet hinge. 4,091,500, Cl. 16-145.000.

Lautenschlager, Karl, to Karl Lautenschlager KG Mobelbeschlagfabrik. Mounting plate for furniture hinges. 4,091,499, Cl. 16-129.000.

Lautenschlager, Karl; and Lautenschlager, Gerhard, to Karl Lautenschlager KG Mobelbeschlagfabrik. Cantilever hinge. 4,091,501, Cl. 16-166.000.

Lautenschlager, Reinhard, to Karl Lautenschlager KG Mobelbeschlagfabrik. Hinge for furniture. 4,091,498, Cl. 16-128.00R.
Lawrence, Robert Raymond. Trussed roof structure for prefabricated buildings. 4,091,582, Cl. 52-79.700.
Lawrence, Tony, to Rotaflex (Great Britian) Limited. Electric current supply installation. 4,092,507, Cl. 200-51.00R.
Lazaridis, Lazaros J.; Searight, Edward F.; and Shefsiek, Paul K., to Thermo Electron Corporation. Deep fat fryer. 4,091,801, Cl. 126-378.000.
Le Carbone-Lorraine: *See—*
Maire, Jacques; and Gremion, Robert, 4,092,395, Cl. 264-221.000.
Leach Company: *See—*
Gollnick, Cyril R., 4,091,944, Cl. 214-302.000.
Leach Corporation: *See—*
Schuessler, John C.; and Tapp, David J., 4,092,620, Cl. 335-128.000.
Leacock, James, to Halcon Research and Development Corp. Recovery of methacrolein. 4,092,132, Cl. 55-48.000.
Leas, Arnold Marcel. Process for maximizing combustion of fuels. 4,091,614, Cl. 60-39.020.
Lechevin, Rene: *See—*
Deman, Pierre; and Lechevin, Rene, 4,092,598, Cl. 325-55.000.
Lee, Chien Yung: *See—*
Wolford, Lionel T.; Lee, Chien Yung; and Dotson, Anderson O., Jr., 4,092,345, Cl. 260-501.160.
Lee, Gene DuPree, to Texas Instruments Incorporated. Wire matrix printer printhead assembly. 4,091,909, Cl. 400-124.000.
Lee, William H.; and Cox, Duncan B., Jr., to Charles Stark Draper Laboratory, Inc., The. Code tracking signal processing system. 4,092,601, Cl. 325-322.000.
Lee, Winston F. Z., to Rockwell International Corporation. Turbine meter in-line checking apparatus and method. 4,091,653, Cl. 73-3.000.
Leeder, Joseph G.: *See—*
Lin, Po-Min; Giacin, Jack R.; Gilbert, Seymour G.; and Leeder, Joseph G., 4,092,219, Cl. 195-29.000.
Legleiter, Paul P. Fluid transfer methods and apparatus. 4,091,846, Cl. 141-1.000.
Lehmann, Helmuth; Lehmann, Rolf; and Christ, Alfred, to Escher Wyss Limited. Hydrostatic support arrangement. 4,091,517, Cl. 29-113.0AD.
Lehmann, Rolf; and Christ, Alfred, to Escher Wyss Limited. Guiding device for continuously cast metal strands and the like. 4,091,862, Cl. 164-447.000.
Lehmann, Rolf: *See—*
Lehmann, Helmuth; Lehmann, Rolf; and Christ, Alfred, 4,091,517, Cl. 29-113.0AD.
Lehmann, Werner, to Mathias Bauerle GmbH. Variable speed control apparatus. 4,091,684, Cl. 74-112.000.
Lehrter, James F., to Raymond Lee Organization, Inc., The, a part interest. Shingle stripper. 4,091,535, Cl. 30-169.000.
Leigh, Barry Rupert, to Josglade Limited. Heat recovery means for drying apparatus. 4,091,547, Cl. 34-86.000.
Lemahieu, Raymond Gerard; Depoorter, Henri; and Vanassche, Willy Joseph, to Agfa-Gevaert, N.V. Light-absorbing dyes for silver halide material. 4,092,168, Cl. 96-84.00R.
Lemercier, Guy, to Commissariat a l'Energie Atomique. Heat-insulating panel. 4,091,591, Cl. 52-613.000.
Lemforder Metallwaren AG: *See—*
Klotz, Werner; and Kindel, Georg, 4,092,078, Cl. 403-221.000.
Lemieux, Roger Joseph. Coin counting and packaging device. 4,091,599, Cl. 53-254.000.
Lemon, Lucien W., to Paccar Inc. Floor structure for refrigerated vehicles. 4,091,743, Cl. 105-375.000.
Leo, Thomas J.; and Reynolds, Michael J., to Wyrough and Loser, Inc. Encapsulation of critical chemicals. 4,092,285, Cl. 260-28.50R.
Leonard, John Joseph; and Kao, Jar-Lin, to Atlantic Richfield Company. Catalytic liquid phase oxidation of unsaturated aldehydes to unsaturated carboxylic acids. 4,092,355, Cl. 260-530.00N.
Le Page, Jean-Francois: *See—*
Franck, Jean-Pierre; and Le Page, Jean-Francois, 4,092,371, Cl. 260-671.00C.
Leszyk, Gerald Martin: *See—*
Novak, Carl Peter; Morrison, Edward Dixon; and Leszyk, Gerald Martin, 4,092,173, Cl. 96-119.00R.
Leuck, Steven M.: *See—*
Anderson, Gordon K.; and Leuck, Steven M., 4,091,667, Cl. 73-170.00R.
Levaillant, Claude: *See—*
Boux, Rene; and Levaillant, Claude, 4,092,538, Cl. 250-336.000.
Lever Bros. Co.: *See—*
Prince, Leon M., 4,092,260, Cl. 252-117.000.
Lever Brothers Company: *See—*
Prince, Leon M., 4,092,259, Cl. 252-117.000.
Leverenz, John H.; Mocho, John H.; and Ambroziak, Robert E., to Gehl Company. Feed grinder and mixer machine. 4,092,004, Cl. 241-56.000.
Levi Strauss & Co.: *See—*
Blessing, Hubert, 4,092,020, Cl. 270-31.000.
Levine, Robert Aaron: *See—*
Massey, James Vincent, III; Levine, Robert Aaron; and Wardlaw, Stephen Clark, 4,091,659, Cl. 73-61.400.
Levy, Warren W., to Simco Company, Inc., The. Electrostatic neutralizer with balanced ion emission. 4,092,543, Cl. 250-423.00R.
Lewis, Jack: *See—*
Lewis, Robert; and Lewis, Jack, 4,091,477, Cl. 4-146.000.
Lewis, Joe. Hose clamp tool. 4,091,483, Cl. 7-132.000.
Lewis, Robert; and Lewis, Jack, to Dolphin Showers (Patent) Limited. Bases for showers. 4,091,477, Cl. 4-146.000.
Lewis, Robert P., to Faser Industries. Sterilizable package and method. 4,091,921, Cl. 206-363.000.
Lewis, Warren R., to United States of America, Energy. Neutronic reactor. 4,092,498, Cl. 176-84.000.
Lewis, William Platt, to Procter & Gamble Company, The. Apparatus and process for manufacture of variegated soap bars. 4,092,388, Cl. 264-75.000.
Lex, Joseph A.: *See—*
Scher, Herbert I.; Ungar, Israel S.; and Lex, Joseph A., 4,092,198, Cl. 156-222.000.
Lidkopings Mekaniska Verkstads AB: *See—*
Nilsson, Bengt, 4,091,571, Cl. 51-103.0TF.
Lie, Svein O. Chair apparatus for use in transport means. 4,091,740, Cl. 105-345.000.
Lienau, Jeffrey A.; and Matthews, Gerald H., to United States of America, Army. Thermal battery firing mechanism. 4,091,710, Cl. 89-1.814.
Liggett Group Inc.: *See—*
Kallianos, Andrew George; Southwick, Everett West; and Simpson, Melvyn Irving, 4,091,823, Cl. 131-17.00R.
Lilienbeck, Klemens: *See—*
Bergk, Berndt; Lilienbeck, Klemens; Ottmann, Gerhard Friedrich; Stolzenbach, Heinrich; Wramba, Herbert; and Wulff, Walter, 4,092,202, Cl. 156-331.000.
Lilley, Virginia Anne, personal representative: *See—*
Dowty, George Herbert, deceased; Lilley, Virginia Anne, personal representative; Barber, Lionel, personal representative; and Kneale, Peter James, personal representative, 4,091,838, Cl. 137-528.000.
Lin, Po-Min; Giacin, Jack R.; Gilbert, Seymour G.; and Leeder, Joseph G. Preparation of enzyme-membrane complexes. 4,092,219, Cl. 195-29.000.
Linde Aktiengesellschaft: *See—*
Linde, Gerhard, 4,091,633, Cl. 62-29.000.
Rohde, Wilhelm, 4,092,131, Cl. 55-33.000.
Linde, Gerhard, to Linde Aktiengesellschaft. Process and apparatus for the separation of a low-boiling gaseous mixture. 4,091,633, Cl. 62-29.000.
Lingl Corporation: *See—*
Lingl, Hans, Jr., 4,092,094, Cl. 432-1.000.
Lingl, Hans, Jr., to Lingl Corporation. Method and apparatus for the controlled distribution of powdered solid fuel to burning units. 4,092,094, Cl. 432-1.000.
Lipetz, Nathan: *See—*
Borowick, John Joseph; Gelernter, Boaz; Lipetz, Nathan; and Stern, Richard A., 4,092,647, Cl. 343-768.000.
Lippert, Roy: *See—*
Lowthorp, Ernest C., deceased; Arnold, Frances T.; Winters, Luther R., Jr.; and Lippert, Roy, 4,091,765, Cl. 118-658.000.
Litt, Gerald J., to New England Nuclear Corporation. Method for solid phase immunological assay of antigen. 4,092,408, Cl. 424-1.000.
Little, Carl H., to Weber-Knapp Company. Counterbalance mechanism. 4,091,502, Cl. 16-190.000.
Little, David C.: *See—*
Meyer, John E.; and Little, David C., 4,092,441, Cl. 427-37.000.
Litton Systems, Inc.: *See—*
Rasmussen, Glenn O., 4,092,513, Cl. 219-10.55F.
Liu, Diomedes, to Sea-Land Service, Inc. Floating dock for handling cargo. 4,091,759, Cl. 114-263.000.
Liu, Quen Ling: *See—*
Wong, Dickson Tak Sun; and Liu, Quen Ling, 4,091,468, Cl. 2-212.000.
Lloyd, John B.: *See—*
Kraeft, Robert W.; and Lloyd, John B., 4,091,946, Cl. 214-518.000.
Lloyd, Samuel Harry, III, to Santa Fe International Corporation. Method of operating twin hull variable draft vessel. 4,091,760, Cl. 114-264.000.
Locke, Joe B.: *See—*
Snyder, David E.; Locke, Joe B.; and Brabits, William C., 4,091,832, Cl. 137-72.000.
Lockley, Sidney R.: *See—*
Crothers, Harry; and Lockley, Sidney R., 4,091,973, Cl. 223-28.000.
Lockwood, Harry Francis; and Kressel, Henry, to RCA Corporation. Stripe contact providing a uniform current density. 4,092,561, Cl. 313-499.000.
Loctite Corporation: *See—*
Douek, Maurice; Schmidt, Gustav A.; Malofsky, Bernard M.; and Hauser, Martin, 4,092,374, Cl. 260-873.000.
Douek, Maurice; Schmidt, Gustav A.; Malofsky, Bernard M.; and Hauser, Martin, 4,092,376, Cl. 260-884.000.
Loews Theatres, Inc.: *See—*
Ihrig, Arthur Morton; and Williams, David Lynn, 4,091,822, Cl. 131-9.000.
Lofmark, Bengt Gustav, to Telefonaktiebolaget L M Ericsson. Apparatus for detecting a voice frequency signal. 4,092,499, Cl. 179-84.0VF.
Lomberk, Edward; and Rosston, Edgar C. Convertible garden rake and cultivating tool. 4,091,879, Cl. 172-373.000.
Longo, John M.; and Maas, Edward T., Jr., to Exxon Research & Engineering Co. Process for preventing ecological contamination due to radioactive ruthenium, molybdenum or technetium. 4,092,265, Cl. 252-301.10W.
Lorsch, Johannes. Apparatus for sorting planar structures having non-round outer contours, specifically slide frames. 4,091,963, Cl. 221-264.000.

Lory, Pierre: *See—*
Zuccaro, Robert; and Lory, Pierre, 4,091,467, Cl. 2-192.000.

Losev, Vladimir Fedorovich: *See—*
Goldring, Grigory Mikhailovich; Koiler, Semen Nusievich; Losev, Vladimir Fedorovich; Pepenko, Vladimir Danilovich; Platov, Evgeny Ivanovich; Rabinovich, Benedikt Veniaminovich; and Sakhanovich, Jury Viktorovich, 4,091,858, Cl. 164-212.000.

Lowe, Alexander George; Derbyshire, Philip Edward; and Papay, Andrew George, to Edwin Cooper and Company Limited. Process of making an oil solution of zinc dihydrocarbyldithiophosphates. 4,092,341, Cl. 260-429.900.

Loweg, Heribert, to Gewerkschaft Eisenhutte Westfalia. Catalytic devices for treating exhaust gases of internal combustion engines. 4,091,616, Cl. 60-295.000.

Lowthorp, Ernest C., deceased (by Lowthorp, Vivian L., executrix); Arnold, Frances T.; Winters, Luther R., Jr.; and Lippert, Roy, to Lowthorp, Vivian L., Executrix of the Estate of Ernest C. Lowthorp, deceased. Developing and fusing apparatus. 4,091,765, Cl. 118-658.000.

Lowthorp, Vivian L., executrix: *See—*
Lowthorp, Ernest C., deceased; Arnold, Frances T.; Winters, Luther R., Jr.; and Lippert, Roy, 4,091,765, Cl. 118-658.000.

Lowthorp, Vivian L., Executrix of the Estate of Ernest C. Lowthorp, deceased: *See—*
Lowthorp, Ernest C., deceased; Arnold, Frances T.; Winters, Luther R., Jr.; and Lippert, Roy, 4,091,765, Cl. 118-658.000.

Lozowski, Joseph F. Electric meter. 4,092,591, Cl. 324-110.000.

LSB Industries, Inc.: *See—*
Murteza, Riza E., 4,091,900, Cl. 192-8.00R.

Lucas Industries Limited: *See—*
Seilly, Alec Harry; and Lakra, Paul, 4,091,784, Cl. 123-139.0AT.

Lucas, John Martin; and Gracovetsky, Serge, to Domtar Inc. Surface sensor. 4,092,068, Cl. 356-73.000.

Ludwig Industries: *See—*
Ludwig, William Frederick, 4,091,706, Cl. 84-411.00R.

Ludwig, William Frederick, to Ludwig Industries. Construction of illuminated drums. 4,091,706, Cl. 84-411.00R.

Luebke, Ralph C., to Moore & Sons, Inc. Lift mechanism for a truck. 4,092,011, Cl. 254-8.00C.

Luecke, Gerald, to Texas Instruments Incorporated. Calculator with interchangeable keyset. 4,092,527, Cl. 364-709.000.

Luke, Patrick: *See—*
Noble, Sidney; and Luke, Patrick, 4,091,563, Cl. 46-142.000.

Lummus Company, The: *See—*
Sze, Morgan C., 4,092,271, Cl. 252-455.00R.

Lundquist, Ingemar H., to Valleylab. Method for intravenous feeding of a patient. 4,091,810, Cl. 128-214.00F.

Lunsford, Thomas Jake. Separable packaging and display system. 4,091,927, Cl. 206-459.000.

Lutkenhouse, Dan J. Expandable trailer van. 4,092,039, Cl. 296-26.000.

Luttbeg, Michael B. Protective enclosure. 4,091,977, Cl. 224-47.000.

Luwa AG: *See—*
Sutter, Hanspeter, 4,091,507, Cl. 19-107.000.

Maa, Peter S.: *See—*
Schlosberg, Richard H.; Maa, Peter S.; and Neavel, Richard C., 4,092,235, Cl. 208-8.000.

Maas, Edward T., Jr.: *See—*
Longo, John M.; and Maas, Edward T., Jr., 4,092,265, Cl. 252-301.10W.

Mabuchi, Kenichi, to Mabuchi Motor Co., Ltd. Forced cooled electric motor. 4,092,556, Cl. 310-57.000.

Mabuchi Motor Co., Ltd.: *See—*
Mabuchi, Kenichi, 4,092,556, Cl. 310-57.000.

MacDonald, Dennis L.; and Weikel, James August, to Procter & Gamble Company, The. Method of steam-stripping roast and ground coffee or tea. 4,092,436, Cl. 426-478.000.

MacFee, Norman W., to Textron Inc. Slide fastener with bottom stop. 4,091,509, Cl. 24-205.11R.

MacFee, Norman W., to Textron Inc. Apparatus for gapping slide fastener chain. 4,091,532, Cl. 29-770.000.

Mackenzie, Harold B.; and Anderson, Ingvar G., to New Life Foundation. Electrostatic separation of plastic film from shredded waste. 4,092,241, Cl. 209-127.00A.

MacLean, Donald L.; and Estes, Robert T., to Monsanto Company. High draw ratio polyester feed yarn and its draw texturing. 4,092,299, Cl. 260-75.00T.

MacLeod, George M.; and Riley, James F., to Monsanto. Wafer packaging system. 4,091,919, Cl. 206-213.100.

MacMillan Bloedel Limited: *See—*
Procter, Alan Robert; and Chow, Wayne Ming, 4,091,749, Cl. 162-25.000.

Madison-Kipp Corporation: *See—*
Thomson, Ronald E.; and Schmitt, James F., 4,091,492, Cl. 15-246.000.

Madsen, Henning Brinch, to Svenska Geotherm Aktiebolag. Heat pump device. 4,091,994, Cl. 237-2.00B.

Madsen, Rud Frik, to Aktieselskabet de Danske Sukkerfabrikker. Method and apparatus for dewatering thickened sludge. 4,092,247, Cl. 210-67.000.

Maeda, Hidetoshi: *See—*
Sasaki, Takehiko; and Maeda, Hidetoshi, 4,091,610, Cl. 58-23.00R.

Maestro, Patrick: *See—*
Demazeau, Gerard; Maestro, Patrick; Plante, Theophile; Pouchard, Michel; and Hagenmuller, Paul, 4,092,439, Cl. 423-607.000.

Maggioni, Virginio: *See—*
Amedei, Giuseppe; Quilico, Carlo Alberto; and Maggioni, Virginio, 4,092,047, Cl. 303-22.00R.

Magne, Frank C.: *See—*
Mod, Robert R.; Magne, Frank C.; Sumrell, Gene; and Novak, Arthur F., 4,092,319, Cl. 260-293.850.

Magyar Tudomanyos Akademia Mezogazdasagi Kutato Intezete: *See—*
Horvath, Istvan; Korospataky, Sandor; Rajki, Sandor; Tejfalussy, Andras; and Tischner, Tibor, 4,091,566, Cl. 47-17.000.

Magyari, Douglas. High temperature caulking composition and method. 4,092,192, Cl. 156-69.000.

Maire, Jacques; and Gremion, Robert, to Le Carbone-Lorraine. Method of making fluid treatment modules. 4,092,395, Cl. 264-221.000.

Majkrzak, Charles Peter; and Brennan, Vishno Edward, to International Telephone & Telegraph Corporation. Arrangement to prevent corona discharge and electric rupture in high voltage electrical components. 4,092,484, Cl. 174-12.00R.

Makhobey, Walter. Flush interrupting attachment for toilet tanks. 4,091,474, Cl. 4-379.000.

Malcolm, Richard, to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Inflatable sleeping bag. 4,091,482, Cl. 5-343.000.

Malen, Charles; Roger, Pierre; Poignant, Jean-Claude; and Pascaud, Xavier, to Science Union et Cie., Societe Francaise de Recherche Medicale. Alkoxy anilides and pharmaceutical compositions. 4,092,423, Cl. 424-274.000.

Malm, Douglas E. Headgear light. 4,092,704, Cl. 362-106.000.

Malofsky, Bernard M.: *See—*
Douek, Maurice; Schmidt, Gustav A.; Malofsky, Bernard M.; and Hauser, Martin, 4,092,374, Cl. 260-873.000.
Douek, Maurice; Schmidt, Gustav A.; Malofsky, Bernard M.; and Hauser, Martin, 4,092,376, Cl. 260-884.000.

Mandala, Charles G.: *See—*
Soulakis, George; and Mandala, Charles G., 4,091,918, Cl. 206-45.130.

Mandell, Arthur: *See—*
United States of America, National Aeronautics and Space Administration; Polhemus, John T.; Morgan, Joseph E.; and Mandell, Arthur, 4,092,633, Cl. 340-213.00R.

Mandras, Christian: *See—*
Rose, Leon; and Mandras, Christian, 4,091,651, Cl. 72-289.000.

Mansei Kogyo Kabushiki Kaisha: *See—*
Goto, Kenjiro, 4,092,096, Cl. 431-253.000.

Mansfield Carbon Products, Inc.: *See—*
Mansfield, Vaughn, 4,091,748, Cl. 110-228.000.

Mansfield, Vaughn, to Mansfield Carbon Products, Inc. Method and apparatus for producing gas from solid municipal waste. 4,091,748, Cl. 110-228.000.

Mantey, Paul-Gerhard: *See—*
Tinnes, Bernhard; and Mantey, Paul-Gerhard, 4,091,971, Cl. 222-603.000.

Mantoux, Gerard, to Bertin & Cie. Push-button operated meter. 4,091,670, Cl. 73-302.000.

Mao, James Chieh-Hsia; Seely, John Hunter; and Fairgrieve, John Scott, to Abbott Laboratories. Treatment of herpes simplex infections. 4,092,412, Cl. 424-212.000.

March Enterprise: *See—*
Swain, Stephen C., 4,092,033, Cl. 280-87.04A.

Marchesi, Carlo M. Combined day and night solar energy system. 4,091,622, Cl. 60-641.000.

Marchewka, Laima: *See—*
Marchewka, Richard B.; and Marchewka, Laima, 4,091,632, Cl. 62-1.000.

Marchewka, Richard B.; and Marchewka, Laima. Beverage cooling device having consumable foodstuff therein. 4,091,632, Cl. 62-1.000.

Marconi Company Limited, The: *See—*
Newington, Geoffrey Thomas, 4,092,646, Cl. 343-749.000.

Marder, Herman L.: *See—*
Huber, William; Field, Nathan D.; Marder, Herman L.; and Cole, Raymond C., 4,091,819, Cl. 128-479.000.

Margen, Peter Heinrich Erwin, to Aktiebolaget Atomenergi. Heat pump system. 4,091,636, Cl. 62-238.000.

Marie, Gilbert: *See—*
Chapelet, Gilbert; Knoche, Hubert; and Marie, Gilbert, 4,092,255, Cl. 252-50.000.

Mark, Victor, to General Electric Company. Non-opaque flame retardant polycarbonate composition. 4,092,291, Cl. 260-45.70S.

Markham, John David, to Associated Electrical Industries Limited. Dynamic braking of direct current motors. 4,092,577, Cl. 318-370.000.

Markow, Edward G.; and Aleck, Benjamin J., to Grumman Aerospace Corporation. Manufacture of torsion bars. 4,092,180, Cl. 148-12.00E.

Marocco, Giuseppe, to Soberman Establishment. Method of making blocks and plates from pieces of marble and other natural stones. 4,092,393, Cl. 264-102.000.

Marrs, Oren L.: *See—*
Uraneck, Carl A.; Burleigh, John E.; and Marrs, Oren L., 4,092,465, Cl. 526-1.000.

Marse, Salvadore. Board game apparatus. 4,092,028, Cl. 273-239.000.

Marti, Heinrich: *See—*
Schmid, Markus; and Marti, Heinrich, 4,091,542, Cl. 33-333.000.

Martin, Harold B.; and Rogg, Herman O., to Graber-Rogg, Inc. Compact chord organ. 4,091,707, Cl. 84-423.000.

Martin, James W., to William Zinnsser & Co., Inc. Method of removing paper adhered to a surface. 4,092,175, Cl. 134-42.000.

Martin, Michael Joseph: *See—*
Underwood, Michael John; Martin, Michael Joseph; and Iles, Michael Victor, 4,092,495, Cl. 179-1.0SM.
Martin, Michel. Machine for chisel forming the teeth on parts of revolution, and in particular wheels of cigarette lighters or the like. 4,091,647, Cl. 72-72.000.
Martin, Philippe, to Commissariat a l'Energie Atomique; and Soudure Autogene Francaise. Sealing device for a vacuum enclosure. 4,092,516, Cl. 219-121.0EB.
Martwick, Wilford E.; Ullrich, John P.; and Kraemer, Arnum E., to Honeywell Inc. Stored energy impact fuze. 4,091,735, Cl. 102-79.000.
Marvin Glass & Associates: *See—*
Barlow, Gordon A.; Brand, Derek A.; and Imatt, Alex, 4,091,995, Cl. 238-10.00A.
Masaki, Kenji; and Minami, Hidehiro, to Nissan Motor Company, Ltd. Car knock preventive system. 4,091,780, Cl. 123-119.00R.
Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Meinke, Peter; and Fiedler, Kurt, 4,091,687, Cl. 74-574.000.
Maschinenfabrik Rissen GmbH: *See—*
Wommelsdorf, Fritz, 4,092,201, Cl. 156-285.000.
Maschinenfabrik Zuckermann Komm. Ges.: *See—*
Schmidt, Erich, 4,091,573, Cl. 51-140.000.
Masco Corporation of Indiana: *See—*
Baker, William, 4,092,594, Cl. 325-21.000.
Mashimo, Yukio: *See—*
Ito, Tadashi; Ito, Fumio; Mashimo, Yukio; Sakurado, Nobuaki; and Shinoda, Nobuhiko, 4,092,652, Cl. 354-23.00D.
Massey, James Vincent, III; Levine, Robert Aaron; and Wardlaw, Stephen Clark. Apparatus for measuring white cell count. 4,091,659, Cl. 73-61.400.
Masterman, Hugh C.: *See—*
Chambers, Derek; and Masterman, Hugh C., 4,092,566, Cl. 315-375.000.
Masui, Takatoshi: *See—*
Mituyasu, Masaki; and Masui, Takatoshi, 4,091,781, Cl. 123-119.0EC.
Mateev, Evgeni Hristov: *See—*
Balevski, Angel Tonchev; Nikolov, Ivan Dimov; Mateev, Evgeni Hristov; Trifonov, Todor Kostadinov; and Kojuharov, Vassil Vladimirov, 4,092,385, Cl. 264-45.500.
Mather, George R., Jr.: *See—*
Bieringer, Robert J.; and Mather, George R., Jr., 4,091,796, Cl. 126-270.000.
Mathews, Raymond William. Apparatus for removing brussels sprouts from the parent stalks. 4,091,820, Cl. 130-30.00R.
Mathias Bauerle GmbH: *See—*
Lehmann, Werner, 4,091,684, Cl. 74-112.000.
Matin, Fereidoon: *See—*
Ku, Joseph P.; Matin, Fereidoon; and Trezise, Richard D., 4,091,913, Cl. 400-124.000.
Matsubara, Hironaga: *See—*
Hayami, Toshiyuki; Matsubara, Hironaga; and Yamanouchi, Shousuke, 4,092,488, Cl. 174-84.00R.
Matsuda, Takaaki: *See—*
Namikawa, Kosuke; Onoda, Hajime; Okamoto, Mineo; Fujii, Isamu; Matsuda, Takaaki; Uebayashi, Mustuo; and Suzuki, Hirosi, 4,091,668, Cl. 73-263.000.
Matsui, Kiyohide: *See—*
Kondo, Kiyoshi; Matsui, Kiyohide; Negishi, Akira; and Takahatake, Yuriko, 4,092,482, Cl. 560-213.000.
Matsumoto, Ken, to Eli Lilly and Company. Cyclohexenyl resorcinol derivatives. 4,092,344, Cl. 260-465.00F.
Matsumoto, Nobuya: *See—*
Yoshizumi, Hajime; Matsumoto, Nobuya; and Fukushi, Osamu, 4,092,434, Cl. 426-13.000.
Matsumura, Yoshikazu: *See—*
Onoe, Yasumitsu; Matsumura, Yoshikazu; Katoh, Hiroshi; Nakajima, Koe; and Sekino, Shozo, 4,092,178, Cl. 148-2.000.
Matsuno, Takashi: *See—*
Tanemura, Mitsuru; Shinozaki, Teizo; Shindo, Minoru; Hata, Shunichi; Mizuno, Koji; Ono, Masayoshi; Wakabayashi, Kiyoshige; Nakano, Toshiaki; Nishii, Yasuho; Matsuno, Takashi; and Ohsugi, Yoshiyuki, 4,092,426, Cl. 424-309.000.
Matsushima, Haruo: *See—*
Suzuki, Ryuji; Yamaguchi, Kimiaki; Nagamoto, Shunichi; Niwa, Takashi; and Matsushima, Haruo, 4,092,512, Cl. 219-10.55F.
Matsushita Electric Industrial Co., Limited: *See—*
Kiuchi, Mitsuyuki; Mizukawa, Takumi; Kominami, Hideyuki; and Amagami, Keizo, 4,092,510, Cl. 219-10.49R.
Nomura, Noboru; Kanai, Kenji; Kaminaka, Nobuyuki; and Nouchi, Norimoto, 4,092,688, Cl. 360-121.000.
Suzuki, Ryuji; Yamaguchi, Kimiaki; Nagamoto, Shunichi; Niwa, Takashi; and Matsushima, Haruo, 4,092,512, Cl. 219-10.55F.
Yanagi, Masahiro, 4,091,660, Cl. 73-658.000.
Matsuzaki, Tsuneo: *See—*
Tamura, Takashi; Matsuzaki, Tsuneo; Kasahara, Jyunkichi; and Nakamura, Ken, 4,091,673, Cl. 73-351.000.
Matthews, Eunice C.: *See—*
Matthews, William C.; and Matthews, Eunice C., 4,091,473, Cl. 4-420.000.
Matthews, Gerald H.: *See—*
Lienau, Jeffrey A.; and Matthews, Gerald H., 4,091,710, Cl. 89-1.814.
Matthews, James D.: *See—*
Padovani, Francois A.; Miller, Michael Brant; Moore, James A.; Fowler, James H.; June, Malcolm Neville; Matthews, James D.; Morton, T. R.; Stotko, Norbert A.; and Palmer, Lewis B., 4,092,446, Cl. 427-213.000.
Matthews, William C.; and Matthews, Eunice C. Adjustable toilet. 4,091,473, Cl. 4-420.000.
Maus, Leo Donald, to Exxon Production Research Company. Artificial lift system for marine drilling riser. 4,091,881, Cl. 175-7.000.
May, Adolf: *See—*
Cuntze, Ulrich; May, Adolf; and Bucking, Hans-Walter, 4,092,253, Cl. 252-8.800.
Mayr, Alois; Koniger, Max; and Obermayer, Gustav, to Consortium fur Elektrochemische Industrie GmbH. Synergistic fungicidal mixture of captafol and thiabendazol. 4,092,422, Cl. 424-270.000.
McCartney, Ronald L.; Hogan, Vaughn C.; Landgreen, Eleanor A.; and Bauerkemper, Michael I., to International Telephone & Telegraph Corporation. Fiber bundle consolidation. 4,092,396, Cl. 264-249.000.
McCaslin, Joe C., to Zap-Lok Systems International. Pipe grooving systems. 4,091,648, Cl. 72-121.000.
McClintock, Wayne E. Multi-use camera harness. 4,091,974, Cl. 224-5.00V.
McCole, Thomas P.: *See—*
Bushey, Robert D.; and McCole, Thomas P., 4,092,167, Cl. 96-76.00C.
McConnaughey, Paul W.: *See—*
Vancheri, Frank J.; Nebash, Stanley P.; and McConnaughey, Paul W., 4,092,123, Cl. 23-254.00R.
McDermott, Muriel: *See—*
Wade, Lisby Lucius; and McDermott, Muriel, 4,092,421, Cl. 424-266.000.
McDonald, Michael S.: *See—*
Bell, Frank H.; Borcherding, Ronald L.; Munson, William O.; McDonald, Michael S.; and Peterson, John A., 4,091,729, Cl. 102-38.000.
McDonnell Douglas Corporation: *See—*
Berg, Robert L.; and Murphy, William J., 4,092,716, Cl. 364-424.000.
Coontz, Leland I.; and Fox, Morton H., 4,092,733, Cl. 365-200.000.
McElroy, David J., to Texas Instruments Incorporated. Static memory cell using field implanted resistance. 4,092,735, Cl. 365-183.000.
McElwain, John Christee: *See—*
Olkowski, Stanley, Jr.; and McElwain, John Christee, 4,091,640, Cl. 64-4.000.
McFarland, William W., to International Paper Company. Sift-proof, shipping and dispensing container. 4,091,984, Cl. 229-23.0BT.
McGuire, Claire L.: *See—*
Jordan, Charles P.; and McGuire, Claire L., 4,091,852, Cl. 150-.500.
McGuire, Willis C.: *See—*
Epstein, Peter F.; and McGuire, Willis C., 4,092,429, Cl. 424-321.000.
McLaughlin, Robert L.; and Wood, Donald C., to DeSoto, Inc. Powder detergent compositions. 4,092,258, Cl. 252-99.000.
McLees, Donald J. Electronic fluid level sensor. 4,091,671, Cl. 73-313.000.
McMaster-Christie, Colin, to Aqua-Marine Mfg. Limited. Faucet assembly. 4,092,085, Cl. 417-44.000.
McNaughton, James L.: *See—*
Horst, William R.; McNaughton, James L.; and Mort, Charles F., 4,092,234, Cl. 204-286.000.
McNaull, Tom M., to International Harvester Company. Fluent material dispenser and bucket therefor. 4,091,968, Cl. 222-282.000.
McQuay-Perfex, Inc.: *See—*
Vogel, Kenneth E.; and Peterson, Dean R., 4,091,637, Cl. 62-276.000.
Mead Corporation, The: *See—*
Calvert, Rodney K., 4,091,937, Cl. 214-1.0BB.
Mead, Richard: *See—*
Raudonis, John Anthony; and Mead, Richard, 4,091,642, Cl. 66-76.000.
Mead, Theodore C.; Sequeira, Avilino, Jr.; and Odell, Norman R., to Texaco Inc. Refrigeration oil processing. 4,092,240, Cl. 208-301.000.
Means, John R., to Porter, Inc. Collapsible boat canopy and storage compartment therefor. 4,091,484, Cl. 9-1.500.
Mechanex Corporation, The: *See—*
Lang, James R., 4,091,894, Cl. 184-103.00R.
Lang, James R., 4,091,895, Cl. 184-103.00R.
Mechanical Products: *See—*
Kirkup, Joseph F., 4,092,623, Cl. 337-66.000.
Meckel, Walter: *See—*
Noll, Klaus; Grammel, Jurgen; and Meckel, Walter, 4,092,286, Cl. 260-29.2TN.
Medical Products Octagon AB: *See—*
Hogberg, Karl Johan, 4,092,705, Cl. 362-294.000.
Meinke, Peter; and Fiedler, Kurt, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft; and Gutehoffnungshutte Sterkrade Aktiengesellschaft. High-speed rotation system. 4,091,687, Cl. 74-574.000.
Meisei Electric Co., Ltd.: *See—*
Furusawa, Kaoru; and Ishigami, Sumiyuki, 4,091,679, Cl. 73-497.000.
Meisner, Alfred; Arnold, Werner; and Ennen, Peter, to DIEHL, Firma. Adjusting arrangement for a digital indicator. 4,091,612, Cl. 58-85.500.
Memorex Corporation: *See—*
Hurtig, Roy E.; and Rojo, Stanley I., 4,091,654, Cl. 73-7.000.
Mendenhall, Charles E.: *See—*
Andrews, Thomas L., Jr.; and Mendenhall, Charles E., 4,092,682, Cl. 360-77.000.

Andrews, Thomas L., Jr.; and Mendenhall, Charles E., 4,092,683, Cl. 360-77.000.

Mennuto, Anthony R. Panel assembly including side caps and panel retaining means associated therewith. 4,091,593, Cl. 52-620.000.

Menzel, Dieter: *See—*
Rohrborn, Hans-Joachim; Homann, Rainer; Conrady, Heribert; and Menzel, Dieter, 4,092,407, Cl. 423-633.000.

Merard, Rene Remy, to Laser Technique S.A. Method of decorating a transparent plastics material article by means of a laser beam. 4,092,518, Cl. 219-121.0LM.

Mercer, Benjamin, Jr.: *See—*
Frederick, Judson G.; Mercer, Benjamin, Jr.; and Poole, John E., 4,092,447, Cl. 427-286.000.

Merck & Co., Inc.: *See—*
Arth, Glen E.; and Wood, Sumner, Jr., deceased, 4,092,413, Cl. 424-241.000.
Baldwin, John J., 4,092,419, Cl. 424-263.000.
Bochis, Richard J., 4,092,321, Cl. 260-294.80C.
Cragoe, Edward J., Jr.; Bicking, John B.; and Smith, Robert L., 4,092,356, Cl. 260-535.00R.
Cragoe, Edward J., Jr.; Schultz, Everett M.; and Stokker, Gerald E., 4,092,414, Cl. 424-248.510.
Vander Zwan, Michael C.; and Reinhold, Donald F., 4,092,314, Cl. 544-277.000.

Messer Griesheim GmbH: *See—*
Roeder, Georg, 4,092,016, Cl. 266-77.000.

Messerschmitt-Bolkow-Blohm GmbH: *See—*
Jonda, Wolfgang, 4,092,453, Cl. 428-255.000.
Richter, Christian, 4,091,471, Cl. 3-1.700.

Mesur-Matic Electronics Corporation: *See—*
Newell, Harold R., 4,092,568, Cl. 318-46.000.

Metacon A.G.: *See—*
Tinnes, Bernhard; and Mantey, Paul-Gerhard, 4,091,971, Cl. 222-603.000.

Metallgesellschaft Aktiengesellschaft: *See—*
Rohrborn, Hans-Joachim; Homann, Rainer; Conrady, Heribert; and Menzel, Dieter, 4,092,407, Cl. 423-633.000.

Metallurgie Hoboken-Overpelt: *See—*
Dompas, John M.; and Petry, Charles J., 4,092,155, Cl. 75-124.000.

Mettler Instrumente AG: *See—*
Rutishauser, Heinz; and Siroky, Otakar, 4,092,121, Cl. 23-253.00R.

Meyer, Daniel R.: *See—*
Krueger, Kenneth A.; and Meyer, Daniel R., 4,091,972, Cl. 222-627.000.

Meyer, John E.; and Little, David C., to GAF Corporation. Roofing granule treatment by coating with a metallic algicide. 4,092,441, Cl. 427-37.000.

Mich, Thomas Frederick, to Warner-Lambert Company. Derivatives of amoxicillin. 4,092,309, Cl. 260-239.100.

Micheron, Francois, to Thomson-CSF. Loud-speaker enclosure with electrical feed-back. 4,092,494, Cl. 179-1.00F.

Michner, James G., to Exxon Research & Engineering Co. Method and apparatus for facsimile scanning. 4,092,576, Cl. 318-314.000.

Mieszczak, William. Machine for installing tees. 4,092,205, Cl. 156-499.000.

Mikes, Sandor; Timar, Matyas; and Bartha, Zoltan, to Taurus Gumiipari Vallalat. Flexible tubes for hydraulic applications. 4,091,843, Cl. 138-127.000.

Mikulec, Richard A.: *See—*
Jones, David A., Jr.; Schlatter, James M.; Mikulec, Richard A.; and Reuter, Judith A., 4,092,304, Cl. 260-112.50R.

Miles Laboratories, Inc.: *See—*
Clemens, Anton Hubert; and Chang, Peter Hon, 4,092,233, Cl. 204-195.00P.
Rupe, Chauncey Orvis; and Bauer, Robert, 4,092,115, Cl. 23-230.00R.

Milkovic, Miran, to General Electric Company. Electronic kWh meter having virtual ground isolation. 4,092,592, Cl. 324-142.000.

Miller, Charles G.: *See—*
United States of America, National Aeronautics and Space Administration; Miller, Charles G.; and Stephens, James B., 4,091,800, Cl. 126-271.000.

Miller, Homer Warner, to Honeywell Information Systems Inc. 5-Bit counter/shift register utilizing current mode logic. 4,092,522, Cl. 235-308.000.

Miller, Michael Brant: *See—*
Padovani, Francois A.; Miller, Michael Brant; Moore, James A.; Fowler, James H.; June, Malcolm Neville; Matthews, James D.; Morton, T. R.; Stotko, Norbert A.; and Palmer, Lewis B., 4,092,446, Cl. 427-213.000.

Miller, Rickie L.; and Walters, Noel E., to Goodyear Tire & Rubber Company, The. Retreading and rebuilding of radial tires. 4,092,196, Cl. 156-96.000.

Miller, Robert Leroy, to Honeywell Inc. Thermographic recorder energizing its heated stylus independently of stylus resistance. 4,092,649, Cl. 346-76.00R.

Millerbernd, Paul A. High level light supporting and light lowering means. 4,092,707, Cl. 362-391.000.

Milliken, Walter Clark: *See—*
Abbott, Arthur Robert; and Milliken, Walter Clark, 4,091,682, Cl. 73-702.000.

Millonzi, Richard P.: *See—*
Radler, Richard W., Jr.; Millonzi, Richard P.; and Bergfjord, John A., 4,092,161, Cl. 96-1.50R.

Minai, Masayoshi: *See—*
Suzuki, Yoshio; Minai, Masayoshi; Hamma, Noritaka; Murayama, Eiichi; and Aono, Shunji, 4,092,324, Cl. 260-295.50R.

Minami, Hidehiro: *See—*
Masaki, Kenji; and Minami, Hidehiro, 4,091,780, Cl. 123-119.00R.

Mine Safety Appliances Company: *See—*
Vancheri, Frank J.; Nebash, Stanley P.; and McConnaughey, Paul W., 4,092,123, Cl. 23-254.00R.

Minolta Camera Kabushiki Kaisha: *See—*
Kawai, Yoshihisa, 4,092,066, Cl. 355-67.000.

Minshull, John Francis: *See—*
Barclay, Donald John; Bird, Colin Leonard; Hallett, Michael Henry; Kirkman, David Horrobin; Minshull, John Francis; and Owen, Charles Edward, 4,092,637, Cl. 340-324.00R.

Miranda, Jorge Cesar: *See—*
Dri, Alfredo Felix; and Miranda, Jorge Cesar, 4,091,751, Cl. 111-2.000.

Mitch, George Charles, to Borg-Warner Corporation. Cooling system for hermetic compressor. 4,091,638, Cl. 62-470.000.

Mitchell, McLaren P. Induction heating appliance circuit that produces relatively high frequency signals directly from a relatively low frequency AC power input. 4,092,509, Cl. 219-10.750.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Nunoshita, Masahiro; and Nomura, Yoshinori, 4,092,060, Cl. 350-96.130.

Mitsubishi Gas Chemical Co., Inc.: *See—*
Tsurumi, Yoshihiro; and Fujioka, Tomio, 4,092,220, Cl. 195-30.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
Yamanaka, Akira; Terakado, Katsumi; and Nagaike, Naofumi, 4,091,888, Cl. 180-82.00R.

Mituyasu, Masaki; and Masui, Takatoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Air-fuel ratio control system in an internal combustion engine. 4,091,781, Cl. 123-119.0EC.

Miura, Hirokazu. Structural element. 4,091,590, Cl. 52-585.000.

Miura, Koji; Takeshima, Kenjun; Kodama, Takuya; Imamura, Masashi; Hongo, Kyoko; Takagawa, Noboru; Hamatani, Yukitaka; and Suzuki, Yasuyuki, to Toyama Chemical Company Limited. Alkanoic acid, process for its production and method of use thereof. 4,092,350, Cl. 260-521.00R.

Miyake, Tetsuya; Seko, Maomi; Takeda, Kunihiko; Ikeda, Akihiko; and Imamura, Kazuo, to Asahi Kasei Kogyo Kabushiki Kaisha. Ion exchange apparatus for uranium technology. 4,092,398, Cl. 423-7.000.

Miyao, Takayuki, to Aisin Seiki Kabushiki Kaisha. Method for controlling continuously variable drive ratio transmissions and a system therefor. 4,091,690, Cl. 74-865.000.

Mizelle, William Robert. Incapacitating anti-personnel smallarms projectile. 4,091,736, Cl. 102-92.700.

Mizukawa, Takumi: *See—*
Kiuchi, Mitsuyuki; Mizukawa, Takumi; Kominami, Hideyuki; and Amagami, Keizo, 4,092,510, Cl. 219-10.49R.

Mizuno, Hiroshi: *See—*
Ando, Shizuo; and Mizuno, Hiroshi, 4,092,496, Cl. 179-6.00R.

Mizuno, Koji: *See—*
Tanemura, Mitsuru; Shinozaki, Teizo; Shindo, Minoru; Hata, Shunichi; Mizuno, Koji; Ono, Masayoshi; Wakabayashi, Kiyoshige; Nakano, Toshiaki; Nishii, Yasuho; Matsuno, Takashi; and Ohsugi, Yoshiyuki, 4,092,426, Cl. 424-309.000.

Mobil Oil Corporation: *See—*
Bridger, Robert F.; and Schmitt, Kirk D., 4,092,254, Cl. 252-49.800.

Mochida Pharmaceutical Co., Ltd.: *See—*
Togo, Takashi, 4,091,814, Cl. 128-303.100.

Mocho, John H.: *See—*
Leverenz, John H.; Mocho, John H.; and Ambroziak, Robert E., 4,092,004, Cl. 241-56.000.

Mod, Robert R.; Magne, Frank C.; Sumrell, Gene; and Novak, Arthur F., to United States of America, Agriculture. Sulfur-containing antimicrobial ester-amides. 4,092,319, Cl. 260-293.850.

Moe, LeRoy Howard. Sound chamber and transducer apparatus for use with harmonica. 4,091,704, Cl. 84-378.000.

Molex Incorporated: *See—*
Funcik, Jack F.; Bennett, Joseph C.; and Fusco, Vito A., deceased, 4,091,695, Cl. 81-9.510.

Moller, Jens L., to Continental Group, Inc., The. Tape seal for container. 4,091,957, Cl. 220-260.000.

Mongin, Pierre: *See—*
Dussaussoy, Pierre; Mongin, Pierre; Rouviere, Rene; and Simon, Gilbert, 4,092,135, Cl. 55-158.000.

Monma, Kodo. Fire extinguishing method and system for large buildings. 4,091,874, Cl. 169-46.000.

Monpetit, Louis; and Hamelin, Gilbert, to Societe Anonyme D.B.A. Electronic control circuit for a carburetor device. 4,091,777, Cl. 123-97.00B.

Monsanto: *See—*
MacLeod, George M.; and Riley, James F., 4,091,919, Cl. 206-213.100.

Monsanto Company: *See—*
Crutchfield, Marvin M.; and Upton, Charles J., 4,092,348, Cl. 260-514.00K.
Freerks, Marshall C.; and Randle, Seth, Sr., 4,092,332, Cl. 260-346.750.
Honaker, Donald E.; and Jacobs, Louis J., Jr., 4,092,098, Cl. 432-19.000.
MacLean, Donald L.; and Estes, Robert T., 4,092,299, Cl. 260-75.00T.
Mount, Ramon A.; Pysz, John F., Jr.; and Raffelson, Harold, 4,092,269, Cl. 252-435.000.

Pickett, Oscar A., Jr.; and Stoddard, John W., 4,092,302, Cl. 260-78.00R.

Montgomery, Alvin W., to Caterpillar Tractor Co. Fuel control cross shaft. 4,091,785, Cl. 123-140.00R.

Montgomery, Ronald R., to Dust Rack, Inc. Treating material applicator for livestock. 4,091,767, Cl. 119-157.000.

Mookherjee, Braja Dulal; Evers, William J.; and Goossens, Alfred E., to International Flavors & Fragrances Inc. 2-Acyl-5-substituted thiatetrahydrofuran-4-ones. 4,092,333, Cl. 260-347.200.

Mookherjee, Braja Dulal; Withycombe, Donald Arthur; Katz, Ira; Goossens, Alfred E.; Vock, Manfred Hugo; Evers, William John; Vinals, Joaquin F.; and Kiwala, Jacob, to International Flavors & Fragrances Inc. 5-Acyl-2-(furfurylthio)dihydro-2,5-dialkyl-3-[2H]furanones. 4,092,334, Cl. 260-347.200.

Moore, E. T., Jr.: *See—*
Godfrey, Charles S.; and Moore, E. T., Jr., 4,091,870, Cl. 166-299.000.

Moore, James A.: *See—*
Padovani, Francois A.; Miller, Michael Brant; Moore, James A.; Fowler, James H.; June, Malcolm Neville; Matthews, James D.; Morton, T. R.; Stotko, Norbert A.; and Palmer, Lewis B., 4,092,446, Cl. 427-213.000.

Moore & Sons, Inc.: *See—*
Luebke, Ralph C., 4,092,011, Cl. 254-8.00C.

Moore, William Percy, to Waverly Chemical Co. Method for producing chemically stable urea-formaldehyde foams. 4,092,277, Cl. 260-2.50F.

Moot, Willem H., to S.I.P., s.p.r.l. Element for building contraction or expansion joints and composite unit obtained with this element. 4,091,589, Cl. 52-573.000.

Moran, Daniel Bryan: *See—*
Hanifin, John William, Jr.; Moran, Daniel Bryan; Albright, Jay Donald; and Allen, George Rodger, Jr., 4,092,311, Cl. 544-224.000.

Moreau, George: *See—*
White, Benjamin J.; Moreau, George; and Dworkin, Robert E., 4,092,610, Cl. 330-207.00A.

Moreno, Roland, to Societe Internationale pour l'Innovation. Systems for storing and transferring data. 4,092,524, Cl. 235-419.000.

Morgan, Joseph E.: *See—*
United States of America, National Aeronautics and Space Administration; Polhemus, John T.; Morgan, Joseph E.; and Mandell, Arthur, 4,092,633, Cl. 340-213.00R.

Morgan, Paul M.: *See—*
Siems, Lee E.; Morgan, Paul M.; and Savit, Carl H., 4,092,629, Cl. 340-15.5TS.

Mori, Takashi; Takaku, Sakae; Oi, Nobuhiro; Shindo, Minoru; Hirano, Takeaki; Katsoka, Shigeyuki; and Furuno, Kouji, to Chugai Seiyaku Kabushiki Kaisha. Pharmaceutical composition and method of the use thereof. 4,092,431, Cl. 424-324.000.

Moriguchi, Seki; Innami, Tatsuo; Uno, Akira; Orikasa, Hiroki; and Sakaba, Toshihito, to Hitachi Koki Company, Limited. Power driven percussion tool. 4,091,981, Cl. 227-8.000.

Morley, Johann J.: *See—*
Grosse, Barry J.; and Morley, Johann J., 4,092,002, Cl. 239-542.000.

Morokuma, Tadashi: *See—*
Aihara, Takayuki; Hori, Kiyoshi; and Morokuma, Tadashi, 4,092,529, Cl. 250-201.000.

Morris, John David, to Northern Telecom Limited. Control of etch rate of silicon dioxide in boiling phosphoric acid. 4,092,211, Cl. 156-644.000.

Morrison, Edward Dixon: *See—*
Novak, Carl Peter; Morrison, Edward Dixon; and Leszyk, Gerald Martin, 4,092,173, Cl. 96-119.00R.

Morse, Clarence Wesley. Garment bag holder. 4,091,976, Cl. 224-45.00R.

Mort, Charles F.: *See—*
Horst, William R.; McNaughton, James L.; and Mort, Charles F., 4,092,234, Cl. 204-286.000.

Morton, Fred H.: *See—*
Wilmeth, Claude H.; and Morton, Fred H., 4,091,890, Cl. 81-57.390.

Morton, T. R.: *See—*
Padovani, Francois A.; Miller, Michael Brant; Moore, James A.; Fowler, James H.; June, Malcolm Neville; Matthews, James D.; Morton, T. R.; Stotko, Norbert A.; and Palmer, Lewis B., 4,092,446, Cl. 427-213.000.

Moser, William R., to Exxon Research & Engineering Co. Hydrodesulfurization of oil utilizing a catalyst of rare earth metal, non-rare earth metal and alumina support. 4,092,239, Cl. 208-213.000.

Moss, Gaylord E., to Hughes Aircraft Company. Immersed reflector quadrant detector. 4,092,531, Cl. 250-216.000.

Moss, James R., to Computer Peripherals, Inc. Record media clamping mechanism. 4,091,912, Cl. 400-146.00R.

Motes-Conners, Corroll J.; and Satterwhite, Lawrence E., to HydroTech International, Inc. Subsea machine tool. 4,091,514, Cl. 29-33.00T.

Motoren- und Turbinen Union Munchen GmbH: *See—*
Schlosser, Werner; and Berger, Horst, 4,092,018, Cl. 269-234.000.

Motorola, Inc.: *See—*
Schoeff, John A., 4,092,726, Cl. 364-829.000.

Motosacoche S.A.: *See—*
Curtil, Remi, 4,091,775, Cl. 123-59.0BM.

Mount, Ramon A.; Pysz, John F., Jr.; and Raffelson, Harold, to Monsanto Company. Phosphorus-vanadium-oxygen catalysts having a specific pore volume. 4,092,269, Cl. 252-435.000.

Mountford, George S., to A-T-O Inc. Adjustable dry pendent sprinkler. 4,091,872, Cl. 169-37.000.

Mueller, Karl Heinz, to Schering Aktiengesellschaft. Method for recovering alkylaluminum chlorides. 4,092,342, Cl. 260-448.00A.

Mueller-Tamm, Heinz: *See—*
Gruber, Wolfgang; Frielingsdorf, Hans; and Mueller-Tamm, Heinz, 4,092,468, Cl. 526-105.000.

Muhle, Dietrich, to Upjohn Company, The. Mixing head. 4,092,118, Cl. 23-252.00R.

Mulder, Hendrik, to N. V. Optische Industrie "De Oude Delft". Intensifier tube of the proximity focus type. 4,092,557, Cl. 313-102.000.

Muller, Hansruedi: *See—*
Zimmermann, Alois; and Muller, Hansruedi, 4,092,600, Cl. 325-55.000.

Muller, Johann; and Staudenrausch, Georg, to Albert Handtmann, Firma. Suspending apparatus for loops of sausage links. 4,091,505, Cl. 17-33.000.

Multicore Solders Limited: *See—*
Arbib, Gordon Francis; and Rubin, Wallace, 4,092,182, Cl. 148-23.000.

Mulvany, R. F., Jr. System and method for heating and forming thermoplastic material. 4,092,390, Cl. 264-94.000.

Munson, William O.: *See—*
Bell, Frank H.; Borcherding, Ronald L.; Munson, William O.; McDonald, Michael S.; and Peterson, John A., 4,091,729, Cl. 102-38.000.

Murabito, Frank. Safety for a revolver. 4,091,557, Cl. 42-66.000.

Murakami, Kazuo, to Nippon Gakki Seizo Kabushiki Kaisha. String musical instrument having a keyboard. 4,091,702, Cl. 84-1.160.

Murakami, Kyoichi: *See—*
Akazawa, Susumu; Tsuchiya, Takao; Murakami, Kyoichi; and Okada, Takashi, 4,092,667, Cl. 358-26.000.

Murakami, Masayuki: *See—*
Yoshioka, Mitsuru; Sendo, Yuji; and Murakami, Masayuki, 4,092,474, Cl. 544-17.000.

Murakami, Masuo; Kawahara, Shigemi; Kawata, Hiroitsu; Okazaki, Kiyoshi; Sekino, Jun; and Shimizu, Hidemi, to Yamanouchi Pharmaceutical Co., Ltd. Process of preparing stable prostaglandin E group-containing formulation. 4,092,428, Cl. 424-317.000.

Murase, Ichiki: *See—*
Sano, Takezo; Murase, Ichiki; Kobayashi, Akira, deceased; Kobayashi, Shuko, successor; and Kobayashi, Tsutomu, guardian, 4,092,250, Cl. 210-500.00M.

Murata, Motomu, to Pioneer Electronic Corporation. Brushless D.C. motor driving system. 4,092,572, Cl. 318-138.000.

Murayama, Eiichi: *See—*
Suzuki, Yoshio; Minai, Masayoshi; Hamma, Noritaka; Murayama, Eiichi; and Aono, Shunji, 4,092,324, Cl. 260-295.50R.

Murdock, Donald; and Stixrud, Thomas E., to United States of America, Navy. Calibration circuit for expendable sonobuoys. 4,092,627, Cl. 340-2.000.

Murphy, William J.: *See—*
Berg, Robert L.; and Murphy, William J., 4,092,716, Cl. 364-424.000.

Murteza, Riza E., to LSB Industries, Inc. Brake drive apparatus. 4,091,900, Cl. 192-8.00R.

Muterel, Roland: *See—*
Carre, Jean-Jacques; and Muterel, Roland, 4,091,619, Cl. 60-553.000.

Mutzl, Josef, to Kraftwerk Union Aktiengesellschaft. Rupture protection device for steam generators of substantially cylindrical shape, preferably of pressurized-water nuclear power plants. 4,092,215, Cl. 176-38.000.

Myers, Ira T.: *See—*
Harrigill, William T., Jr.; and Myers, Ira T., 4,092,712, Cl. 363-60.000.

Myers, John L., to Textron Inc. Service poles. 4,092,486, Cl. 174-48.000.

N-S-W Corporation: *See—*
Wilmeth, Claude H.; and Morton, Fred H., 4,091,890, Cl. 81-57.390.

N. V. Optische Industrie "De Oude Delft": *See—*
Mulder, Hendrik, 4,092,557, Cl. 313-102.000.

Nafissi Varchei, Mohammad Mehdi: *See—*
Daniels, Peter J. L.; and Nafissi Varchei, Mohammad Mehdi, 4,092,359, Cl. 260-563.00R.

Nagaike, Naofumi: *See—*
Yamanaka, Akira; Terakado, Katsumi; and Nagaike, Naofumi, 4,091,888, Cl. 180-82.00R.

Nagamoto, Shunichi: *See—*
Suzuki, Ryuji; Yamaguchi, Kimiaki; Nagamoto, Shunichi; Niwa, Takashi; and Matsushima, Haruo, 4,092,512, Cl. 219-10.55F.

Nagaoka, Yoshihiko: *See—*
Shiraishi, Tatsuo; Kishiwada, Susumu; and Nagaoka, Yoshihiko, 4,092,354, Cl. 260-530.00N.

Nakagawa, Masashi, to Kabushiki Kaisha Aiki Shoji. Apparatus for deforming boiled egg. 4,092,093, Cl. 425-398.000.

Nakagawa, Tadashi: *See—*
Onda, Eiichi; Koyama, Mitsuo; and Nakagawa, Tadashi, 4,092,657, Cl. 354-234.000.

Nakajima, Koe: *See—*
Onoe, Yasumitsu; Matsumura, Yoshikazu; Katoh, Hiroshi; Nakajima, Koe; and Sekino, Shozo, 4,092,178, Cl. 148-2.000.

Nakajima, Yasuo: *See—*
Hayashi, Yoshimasa; Kuroda, Hiroshi; Nakajima, Yasuo; and Yoshimura, Tooru, 4,091,615, Cl. 60-274.000.

Nakamoto, Keiji: *See—*
Hori, Yutaka; Honda, Zenzo; Suzuki, Kenji; Nakamoto, Keiji; and Yamamoto, Yoshiharu, 4,092,452, Cl. 428-215.000.
Nakamoto, Yutaka. Sequential control device. 4,092,570, Cl. 318-102.000.
Nakamura, Hiromi: *See—*
Komiyama, Yoshizo; Nakamura, Hiromi; and Abe, Hiroaki, 4,091,970, Cl. 222-596.000.
Nakamura, Ken: *See—*
Tamura, Takashi; Matsuzaki, Tsuneo; Kasahara, Jyunkichi; and Nakamura, Ken, 4,091,673, Cl. 73-351.000.
Nakano, Koichiro: *See—*
Izawa, Tetsuo; Kajikawa, Shuji; Satomi, Koji; Nakano, Koichiro; Kurosawa, Shinichi; Hirai, Keitaro; and Tsukada, Yuichi, 4,091,545, Cl: 34-9.000.
Nakano, Toshiaki: *See—*
Tanemura, Mitsuru; Shinozaki, Teizo; Shindo, Minoru; Hata, Shunichi; Mizuno, Koji; Ono, Masayoshi; Wakabayashi, Kiyoshige; Nakano, Toshiaki; Nishii, Yasuho; Matsuno, Takashi; and Ohsugi, Yoshiyuki, 4,092,426, Cl. 424-309.000.
Nakaso, Tohru; Hosokawa, Manabu; Nomura, Kenzi; and Hikosaka, Tatsuya, to Toyoda Machine Works, Ltd. Machine tool with an automatic tool exchanger. 4,091,526, Cl. 29-568.000.
Nalco Chemical Co.: *See—*
Bridwell, Billy W.; and Johnson, Carl E., 4,092,367, Cl. 568-785.000.
Namikawa, Kosuke; Onoda, Hajime; Okamoto, Mineo; Fujii, Isamu; Matsuda, Takaaki; Uebayashi, Mustuo; and Suzuki, Hirosi, to Kimmon Manufacturing Co., Ltd.; Kabushiki Kaisha Takenaka Seisakusho; and Aichi Tokei Denki K.K. Diaphragm type gas meter. 4,091,668, Cl. 73-263.000.
Nanba, Kyosuke: *See—*
Nemoto, Yukiyasu; and Nanba, Kyosuke, 4,091,630, Cl. 61-72.700.
Nannichi, Yasuo: *See—*
Sakuma, Isamu; Yonezu, Hiroo; Nishida, Katsuhiko; Kamejima, Taibun; Yuasa, Tonao; Ueno, Masayasu; Uji, Toshio; Nannichi, Yasuo; and Hayashi, Izuo, 4,092,614, Cl. 331-94.50P.
Narayan, Kailash; and Pick, Richard D., to Atlantic Richfield Company. Recovery of uranium from carbonate leach solutions. 4,092,399, Cl. 423-7.000.
Narayan, Thirumurti, to BASF Wyandotte Corporation. Process for the preparation of foams characterized by isocyanurate and urethane linkages. 4,092,276, Cl. 260-2.5AB.
Narayanan, Venkatachala L.: *See—*
Hauck, Frederic Peter; Reid, Joyce; Narayanan, Venkatachala L.; Cimarusti, Christopher M.; Haugwitz, Rudiger D.; and Sundeen, Joseph E., 4,092,318, Cl. 260-293.560.
National Distillers and Chemical Corp.: *See—*
Braus, Harry; and Woltermann, Jay R., 4,092,292, Cl. 260-45.75B.
Voos, Frank J., 4,091,999, Cl. 239-289.000.
National Semiconductor Corporation: *See—*
Frederiksen, Thomas M.; Sleeth, Robert S.; and Howard, William M., 4,092,611, Cl. 330-261.000.
Naylor, Edward Leonard: *See—*
Ellis, Christopher Ian Arthur; and Naylor, Edward Leonard, 4,091,833, Cl. 137-93.000.
NCR Corporation: *See—*
Horst, William R.; McNaughton, James L.; and Mort, Charles F., 4,092,234, Cl. 204-286.000.
Lauffer, Donald K., 4,092,550, Cl. 307-229.000.
Neal, Loyd L. Ladder having adjustable leg extensions. 4,091,893, Cl. 182-204.000.
Neal, Wayne R., to General Electric Company. Pulse circuit for gaseous discharge lamps. 4,092,565, Cl. 315-283.000.
Neavel, Richard C.: *See—*
Schlosberg, Richard H.; Maa, Peter S.; and Neavel, Richard C., 4,092,235, Cl. 208-8.000.
Nebash, Stanley P.: *See—*
Vancheri, Frank J.; Nebash, Stanley P.; and McConnaughey, Paul W., 4,092,123, Cl. 23-254.00R.
Negishi, Akira: *See—*
Kondo, Kiyoshi; Matsui, Kiyohide; Negishi, Akira; and Takahatake, Yuriko, 4,092,482, Cl. 560-213.000.
Neidl, Herbert, to Kraftwerk Union Aktiengesellschaft. Method for determining the activity concentration in waste gases for specific nuclides. 4,092,541, Cl. 250-364.000.
Nelson, Barton R., to Nelson Irrigation Corporation. Sprinkler irrigation system and apparatus for direction a stream of water into the atmosphere. 4,091,996, Cl. 239-177.000.
Nelson Irrigation Corporation: *See—*
Nelson, Barton R., 4,091,996, Cl. 239-177.000.
Nelson, Mary E. Strap for immobilizing human limb during surgery. 4,091,808, Cl. 128-133.000.
Nemesi, Steve A., to General Resource Corp. Centrifugal fan enclosure. 4,092,088, Cl. 417-360.000.
Nemoto, Yukiyasu; and Nanba, Kyosuke, to Kubota, Ltd. Intermediate sleeve for installing pipeline by propelling pipes underground. 4,091,630, Cl. 61-72.700.
Net Posts Inc.: *See—*
Hoover, Richard L., 4,092,024, Cl. 273-29.0BF.
Networks Electronic Corp.: *See—*
Patrichi, Mihai D., 4,091,621, Cl. 60-635.000.
Neumaier, Hubert: *See—*
Staendeke, Horst; and Neumaier, Hubert, 4,092,363, Cl. 260-606.50P.
Neumann, Harry: *See—*
Peddinghaus, Gunther; Neumann, Harry; and Wittenstein, Horst, 4,092,091, Cl. 425-62.000.
Neuray, Dieter; Vernaleken, Hugo; and Rudolph, Hans, to Bayer Aktiengesellschaft. Polycarbonates. 4,092,243, Cl. 210-41.000.
New England Nuclear Corporation: *See—*
Litt, Gerald J., 4,092,408, Cl. 424-1.000.
New Life Foundation: *See—*
Mackenzie, Harold B.; and Anderson, Ingvar G., 4,092,241, Cl. 209-127.00A.
Newbould, Adrian Orton, to General Electric Company Limited, The. Electrical coupling arrangements. 4,092,582, Cl. 323-48.000.
Newell, Harold R., to Mesur-Matic Electronics Corporation. Interpolating stepping motor system. 4,092,568, Cl. 318-46.000.
Newington, Geoffrey Thomas, to Marconi Company Limited, The. Flexible antenna with capacative plate coupling. 4,092,646, Cl. 343-749.000.
Newman, Douglas A.; and Schlotzhauer, Allan T., to Columbia Ribbon & Carbon Mfg. Co., Inc. Transfer elements and process. 4,092,456, Cl. 428-307.000.
Newsom, C. Fred, to Tattle-Tale, Inc. Single use monitors for automatic safety controls of electrically energized apparatus. 4,092,625, Cl. 337-405.000.
Newton, Gerald S., to Graham Magnetics Incorporated. Thermally resistant magnetic tape enclosed in protective container. 4,091,924, Cl. 206-389.000.
NGK Spark Plug Co. Ltd.: *See—*
Yamada, Shigeyasu, 4,092,558, Cl. 313-131.00R.
Nichiryo Co., Ltd.: *See—*
Oshikubo, Yuji, 4,091,677, Cl. 73-425.600.
Nickey, George Allen: *See—*
Heckman, Russell William; and Nickey, George Allen, 4,092,382, Cl. 264-25.000.
Nieh, Edward C. Y., to Texaco Development Corporation. Synthesis of C-alkyl-triethylenediamines. 4,092,316, Cl. 544-351.000.
Nihon Hoso Kikai K.K.: *See—*
Izawa, Teruaki, 4,091,723, Cl. 100-4.000.
Nihon Repro Machine Kogyo Kabushiki Kaisha: *See—*
Kinoshita, Tomoo, 4,091,967, Cl. 222-238.000.
Nijman, John Peter; and Patterson, Terence Neil, to Bunker Ramo Corporation. Field termination tool having connector reference plane apparatus and hinge insertion arms. 4,091,530, Cl. 29-749.000.
Nikolov, Ivan Dimov: *See—*
Balevski, Angel Tonchev; Nikolov, Ivan Dimov; Mateev, Evgeni Hristov; Trifonov, Todor Kostadinov; and Kojuharov, Vassil Vladimirov, 4,092,385, Cl. 264-45.500.
Nilsen, Alfred: *See—*
Calkins, James Stewart; and Nilsen, Alfred, 4,092,112, Cl. 21-108.000.
Nilsson, Bengt, to Lidkopings Mekaniska Verkstads AB. Casing for the grinding position in a centerless grinding machine. 4,091,571, Cl. 51-103.0TF.
Nimetz, Jack. Brush pointer. 4,091,489, Cl. 15-104.920.
Nippon Coinco Co., Ltd.: *See—*
Hayashi, Yukichi; Tamura, Masayuki; Sugimoto, Osamu; Kobayashi, Shinichi; and Tanaka, Masanori, 4,091,908, Cl. 194-100.00A.
Nippon Electric Co., Ltd.: *See—*
Kozai, Teruo; Ohara, Shigeharu; Suzuki, Hiroshi; and Yanagihara, Shingo, 4,092,176, Cl. 134-186.000.
Sakuma, Isamu; Yonezu, Hiroo; Nishida, Katsuhiko; Kamejima, Taibun; Yuasa, Tonao; Ueno, Masayasu; Uji, Toshio; Nannichi, Yasuo; and Hayashi, Izuo, 4,092,614, Cl. 331-94.50P.
Tsuzuki, Naobumi; Koji, Tetsu; and Noguchi, Kazuo, 4,092,445, Cl. 427-85.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Murakami, Kazuo, 4,091,702, Cl. 84-1.160.
Nippon Kokan Kabushiki Kaisha: *See—*
Izawa, Tetsuo; Kajikawa, Shuji; Satomi, Koji; Nakano, Koichiro; Kurosawa, Shinichi; Hirai, Keitaro; and Tsukada, Yuichi, 4,091,545, Cl. 34-9.000.
Nippon Steel Corporation: *See—*
Kataoka, Seiji; Shimizu, Tutomu; and Katwuno, Kesao, 4,092,222, Cl. 202-227.000.
Onoe, Yasumitsu; Matsumura, Yoshikazu; Katoh, Hiroshi; Nakajima, Koe; and Sekino, Shozo, 4,092,178, Cl. 148-2.000.
Nippondenso Co., Ltd.: *See—*
Imai, Takeshi, 4,092,487, Cl. 174-52.0PE.
Nipponkai Heavy Industries Co., Ltd.: *See—*
Kikuchi, Yosio, 4,092,134, Cl. 55-109.000.
Nishida, Katsuhiko: *See—*
Sakuma, Isamu; Yonezu, Hiroo; Nishida, Katsuhiko; Kamejima, Taibun; Yuasa, Tonao; Ueno, Masayasu; Uji, Toshio; Nannichi, Yasuo; and Hayashi, Izuo, 4,092,614, Cl. 331-94.50P.
Nishii, Yasuho: *See—*
Tanemura, Mitsuru; Shinozaki, Teizo; Shindo, Minoru; Hata, Shunichi; Mizuno, Koji; Ono, Masayoshi; Wakabayashi, Kiyoshige; Nakano, Toshiaki; Nishii, Yasuho; Matsuno, Takashi; and Ohsugi, Yoshiyuki, 4,092,426, Cl. 424-309.000.
Nishikawa, Masaji: *See—*
Tsuda, Hiroshi; Nishikawa, Masaji; Kimura, Katsuhiko; and Sato, Eiichi, 4,092,065, Cl. 355-8.000.
Nishikawa, Masao, to Shin-Shirasuna Electric Corp. Bias setting method for magnetic recording-reproducing apparatus. 4,092,678, Cl. 360-31.000.
Nishimura, Akira, to Hitachi, Ltd. Control rod drives for nuclear reactors. 4,092,213, Cl. 176-36.00R.

Nishimura, Masaaki; and Arai, Haruhiko, to Kao Soap Co., Ltd. Liquid detergent composition. 4,092,272, Cl. 252-545.000.
Nishioka, Yoshiki: *See—*
Suzuki, Chuji; Yasuda, Syoichi; and Nishioka, Yoshiki, 4,092,631, Cl. 340-146.30J.
Nishioka, Yuji; Tokyama, Tetsuya; and Takei, Toshiyuki, to Onkyo Kabushiki Kaisha. Automatic frequency control for FM-receiver. 4,092,602, Cl. 325-346.000.
Nishiura, Toyozi: *See—*
Aoki, Hatsuo; Nishiura, Toyozi; and Imanaka, Hiroshi, 4,092,411, Cl. 424-114.000.
Niskin, Shale J. Combined housing and standard for water flow meters. 4,091,666, Cl. 73-170.00A.
Niskin, Shale J. Water sample collecting device. 4,091,676, Cl. 73-425.40R.
Nissan Motor Company, Ltd.: *See—*
Hamada, Hideo, 4,091,902, Cl. 192-.076.
Hayashi, Yoshimasa; Kuroda, Hiroshi; Nakajima, Yasuo; and Yoshimura, Tooru, 4,091,615, Cl. 60-274.000.
Masaki, Kenji; and Minami, Hidehiro, 4,091,780, Cl. 123-119.00R.
Nitto Electric Industrial Co., Ltd.: *See—*
Hori, Yutaka; Honda, Zenzo; Suzuki, Kenji; Nakamoto, Keiji; and Yamamoto, Yoshiharu, 4,092,452, Cl. 428-215.000.
Niu, George: *See—*
Chau, Yuk Bun; Niu, George; and Staffelbach, Rudolph, 4,092,589, Cl. 324-73.00R.
Niwa, Takashi: *See—*
Suzuki, Ryuji; Yamaguchi, Kimiaki; Nagamoto, Shunichi; Niwa, Takashi; and Matsushima, Haruo, 4,092,512, Cl. 219-10.55F.
Noble, Sidney; and Luke, Patrick. Fighting doll and fight ring with doll manipulator. 4,091,563, Cl. 46-142.000.
Nogradi, Mihaly: *See—*
Farkas, Lorand; Nogradi, Mihaly; Pfliegel, Todor; Antus, Sandor; and Gottsegen, Agnes, 4,092,346, Cl. 260-511.000.
Noguchi, Kazuo: *See—*
Tsuzuki, Naobumi; Koji, Tetsu; and Noguchi, Kazuo, 4,092,445, Cl. 427-85.000.
Noll, Klaus; Grammel, Jurgen; and Meckel, Walter, to Bayer Aktiengesellschaft. Production of water-dispersible polyurethanes having ionic groups and hydrophilic side chains. 4,092,286, Cl. 260-29.2TN.
Nomura, Kenzi: *See—*
Nakaso, Tohru; Hosokawa, Manabu; Nomura, Kenzi; and Hikosaka, Tatsuya, 4,091,526, Cl. 29-568.000.
Nomura, Noboru; Kanai, Kenji; Kaminaka, Nobuyuki; and Nouchi, Norimoto, to Matsushita Electric Industrial Co. Ltd. Multi-track thin film magnetic head. 4,092,688, Cl. 360-121.000.
Nomura, Takao; Umemoto, Yoshiro; and Sakamoto, Tatsuo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Process for manufacturing an automotive ceiling panel. 4,092,200, Cl. 156-245.000.
Nomura, Yoshinori: *See—*
Nunoshita, Masahiro; and Nomura, Yoshinori, 4,092,060, Cl. 350-96.130.
Norris, Alan Hedley: *See—*
Chambley, Phillip Wayne; Norris, Alan Hedley; Frazier, Robert Doyal; and Cromer, Dwain Edwin, 4,091,512, Cl. 28-171.000.
Northern Telecom Limited: *See—*
Morris, John David, 4,092,211, Cl. 156-644.000.
Northup, John D. Linerless container closure. 4,091,948, Cl. 215-222.000.
Norton, Richard V., to Suntech, Inc. Electrochemical process for the manufacture of terephthalic acid. 4,092,230, Cl. 204-180.00P.
Norton, Thomas R.; and Geller, Stephen I., to Xerox Corporation. Parallel command-status interface through multiplexed serial link. 4,092,714, Cl. 364-200.000.
Norvell, Bill R.: *See—*
Collins, Dean R.; and Norvell, Bill R., 4,092,734, Cl. 365-238.000.
Nouchi, Norimoto: *See—*
Nomura, Noboru; Kanai, Kenji; Kaminaka, Nobuyuki; and Nouchi, Norimoto, 4,092,688, Cl. 360-121.000.
Novak, Arthur F.: *See—*
Mod, Robert R.; Magne, Frank C.; Sumrell, Gene; and Novak, Arthur F., 4,092,319, Cl. 260-293.850.
Novak, Carl Peter; Morrison, Edward Dixon; and Leszyk, Gerald Martin, to Eastman Kodak Company. Photographic elements coated with protective overcoats. 4,092,173, Cl. 96-119.00R.
Nozaki, Kenzie: *See—*
Gatti, Anthony R.; Hokanson, James S.; and Nozaki, Kenzie, 4,092,126, Cl. 44-51.000.
NRM Corporation: *See—*
Yuhas, Gerald Joseph; and Turk, Leonard G., 4,092,090, Cl. 425-28.00P.
Nukem GmbH: *See—*
Hrovat, Milan F., 4,092,384, Cl. 264-.500.
Huschka, Hans; and Herrmann, Franz Josef, 4,092,218, Cl. 176-84.000.
Nunoshita, Masahiro; and Nomura, Yoshinori, to Mitsubishi Denki Kabushiki Kaisha. Thin film optical switching device. 4,092,060, Cl. 350-96.130.
Nyswander, Reuben E.; and Stewart, Paul E., to United States of America, Navy. Thin foil pulse transformer coil for reducing distributed and leakage inductance. 4,092,621, Cl. 336-184.000.
Oates, William Lee, to Timex Corporation. Process for holding and cutting sheet glass. 4,091,580, Cl. 51-283.00R.
O'Banion, John D. Gas cap. 4,091,959, Cl. 220-304.000.
Obear, Robert F.; and Rist, Bruno A., to Western Gear Corporation. Rotary cutting blade control system. 4,091,698, Cl. 83-34.000.
Ober, Howard R., to Trans-America Power Equipment, Inc. Log splitting apparatus. 4,091,851, Cl. 144-193.00R.
Obermayer, Gustav: *See—*
Mayr, Alois; Koniger, Max; and Obermayer, Gustav, 4,092,422, Cl. 424-270.000.
Oce-van der Grinten N.V.: *See—*
Houtermans, Antonius H. I.; and Kamphuis, Johannes G., 4,092,170, Cl. 96-91.00R.
Odell, Norman R.: *See—*
Mead, Theodore C.; Sequeira, Avilino, Jr.; and Odell, Norman R., 4,092,240, Cl. 208-301.000.
Odermann, Charles Robert, to Singer Company, The. Buttonhole gauging presser device. 4,091,752, Cl. 112-75.000.
Odetics, Inc.: *See—*
Schulz, Gordon, 4,092,686, Cl. 360-95.000.
Offutt, Harry C., III. Extension spray device. 4,092,000, Cl. 239-532.000.
Ogata, Kazumi; and Iwata, Shuzo, to Senju Pharmaceutical Co., Ltd. Stabilization of pyrido[3,2-a]phenoxazine compounds. 4,092,410, Cl. 424-78.000.
Ogawa, Kinya: *See—*
Arai, Shigeru; Ito, Kenichi; Ogawa, Kinya; Kurimoto, Kazuhiko; and Shirota, Yoshihiro, 4,092,471, Cl. 528-502.000.
Ogimachi, Naomi N.: *See—*
Frankel, Milton B.; and Ogimachi, Naomi N., 4,092,336, Cl. 260-348.450.
Ogino, Katsuhiko: *See—*
Furuoya, Itsuo; Kobayashi, Atsuo; and Ogino, Katsuhiko, 4,092,372, Cl. 260-681.000.
Ogishi, Masaaki; and Azuma, Akira, to Yoshida Kogyo K.K. Apparatus for automatically controlling the operation of automatic door. 4,092,575, Cl. 318-282.000.
Ogman, Abraham, to Avco Corporation. Apparatus for concentrating a feed stream. 4,091,635, Cl. 62-123.000.
Ohara, Shigeharu: *See—*
Kozai, Teruo; Ohara, Shigeharu; Suzuki, Hiroshi; and Yanagihara, Shingo, 4,092,176, Cl. 134-186.000.
Ohsako, Kyoichi; and Oyama, Katsuyoshi, to Laurel Bank Machine Co., Ltd. Timing signal generating device. 4,092,533, Cl. 250-231.0SE.
Ohsugi, Yoshiyuki: *See—*
Tanemura, Mitsuru; Shinozaki, Teizo; Shindo, Minoru; Hata, Shunichi; Mizuno, Koji; Ono, Masayoshi; Wakabayashi, Kiyoshige; Nakano, Toshiaki; Nishii, Yasuho; Matsuno, Takashi; and Ohsugi, Yoshiyuki, 4,092,426, Cl. 424-309.000.
Oi, Nobuhiro: *See—*
Mori, Takashi; Takaku, Sakae; Oi, Nobuhiro; Shindo, Minoru; Hirano, Takeaki; Katsoka, Shigeyuki; and Furuno, Kouji, 4,092,431, Cl. 424-324.000.
Oishi, Toshio; Kitano, Takashi; Sasaki, Hiroshi; and Yamashita, Tetuo, to Arakawa Rinsan Kagaku Kogyo Kabushiki Kaisha. Gravure ink binder for paper and process for preparing the same. 4,092,283, Cl. 260-27.0BB.
Okabayashi, Keiichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Vacuum advancer system for a gasoline engine. 4,091,778, Cl. 123-117.00A.
Okada, Takashi: *See—*
Akazawa, Susumu; Tsuchiya, Takao; Murakami, Kyoichi; and Okada, Takashi, 4,092,667, Cl. 358-26.000.
Okamoto, Mineo: *See—*
Namikawa, Kosuke; Onoda, Hajime; Okamoto, Mineo; Fujii, Isamu; Matsuda, Takaaki; Uebayashi, Mustuo; and Suzuki, Hirosi, 4,091,668, Cl. 73-263.000.
Okamoto, Rokuro; Fukumoto, Tsumoru; Takamatsu, Akira; and Takeuchi, Tomio, to Sanraku Ocean Co., Ltd. Tylosin derivatives and their manufacturing process. 4,092,473, Cl. 536-17.000.
Okazaki, Kiyoshi: *See—*
Murakami, Masuo; Kawahara, Shigemi; Kawata, Hiroitsu; Okazaki, Kiyoshi; Sekino, Jun; and Shimizu, Hidemi, 4,092,428, Cl. 424-317.000.
Okuma Seisakusho Co. Ltd.: *See—*
Kimura, Chiyuki, 4,091,561, Cl. 46-1.00K.
Kimura, Chiyuki, 4,091,562, Cl. 46-44.000.
Olds, Walter F.: *See—*
Valko, Emery I., deceased; Tesoro, Giuliana C.; and Olds, Walter F., 4,092,108, Cl. 8-116.00P.
Olinkraft, Inc.: *See—*
Booth, Vernard S.; and Oswalt, Billy W., 4,091,983, Cl. 229-15.000.
Eberle, Robert T., 4,091,986, Cl. 229-62.500.
Olkowski, Stanley, Jr.; and McElwain, John Christee, to Rockwell International Corporation. Power drive yoke. 4,091,640, Cl. 64-4.000.
Olsen, Carlton Edward; and Serpa, Leroy Jasper, to International Business Machines Corporation. Double exposure and double etch technique for producing precision parts from crystallizable photosensitive glass. 4,092,166, Cl. 96-38.200.
Olson, Gust A.: *See—*
Bolton, Edgar A.; and Olson, Gust A., 4,091,910, Cl. 400-131.000.
Olympus Optical Company Limited: *See—*
Aihara, Takayuki; Hori, Kiyoshi; and Morokuma, Tadashi, 4,092,529, Cl. 250-201.000.
Shimizu, Akira, 4,092,615, Cl. 331-94.50S.
Tsuda, Hiroshi; Nishikawa, Masaji; Kimura, Katsuhiko; and Sato, Eiichi, 4,092,065, Cl. 355-8.000.
Onda, Eiichi; Koyama, Mitsuo; and Nakagawa, Tadashi, to Seiko Koki Kabushiki Kaisha. Electrically operated shutter with a mechanical control. 4,092,657, Cl. 354-234.000.

Onderka, Georg, to Deggendorfer Werft und Eisenbau G.m.b.H. Hydraulic system for opening and closing hopper barges. 4,091,715, Cl. 91-1.000.

Onembo, Eli N., to Singer Company, The. Looper throw-out mechanism for sewing machine. 4,091,754, Cl. 112-200.000.

Onkyo Kabushiki Kaisha: *See—*
Hino, Masanori; Eguchi, Taro; and Shiraga, Chitoshi, 4,091,891, Cl. 181-185.000.
Nishioka, Yuji; Tokyama, Tetsuya; and Takei, Toshiyuki, 4,092,602, Cl. 325-346.000.

Ono, Masayoshi: *See—*
Tanemura, Mitsuru; Shinozaki, Teizo; Shindo, Minoru; Hata, Shunichi; Mizuno, Koji; Ono, Masayoshi; Wakabayashi, Kiyoshige; Nakano, Toshiaki; Nishii, Yasuho; Matsuno, Takashi; and Ohsugi, Yoshiyuki, 4,092,426, Cl. 424-309.000.

Onoda, Hajime: *See—*
Namikawa, Kosuke; Onoda, Hajime; Okamoto, Mineo; Fujii, Isamu; Matsuda, Takaaki; Uebayashi, Mustuo; and Suzuki, Hirosi, 4,091,668, Cl. 73-263.000.

Onoe, Yasumitsu; Matsumura, Yoshikazu; Katoh, Hiroshi; Nakajima, Koe; and Sekino, Shozo, to Nippon Steel Corporation. Process for producing a steel having excellent strength and toughness. 4,092,178, Cl. 148-2.000.

Oosterling, Pieter Adriaan; and Vissers, Hendrik, to Vicon N.V. Device for compressing agricultural crop into a bunch. 4,091,603, Cl. 56-346.000.

Oosterwijk, Hendrik Harm Jannes; and Torenbeek, Reinder, to Akzona Incorporated. Stable, pumpable, aqueous suspensions of organic peroxides. 4,092,470, Cl. 526-227.000.

Orikasa, Hiroki: *See—*
Moriguchi, Seki; Innami, Tatsuo; Uno, Akira; Orikasa, Hiroki; and Sakaba, Toshihito, 4,091,981, Cl. 227-8.000.

Oroshnik, William, to SCM Corporation. Synthesis of Vitamin A, intermediates and conversion thereof to Vitamin A. 4,092,366, Cl. 568-824.000.

Orr, Thomas: *See—*
Pinder, Russell Stuart, 4,091,803, Cl. 128-2.05P.

Ortiz, Antonio. Wet-sanding machine. 4,091,577, Cl. 51-170.00T.

Osaki Electric Co. Ltd.: *See—*
Watanabe, Kazumi, 4,092,590, Cl. 324-107.000.

Oshikubo, Yuji, to Nichiryo Co., Ltd. Pipetting apparatus. 4,091,677, Cl. 73-425.600.

Osmo Antero Suovaniemi: *See—*
Suovaniemi, Osmo; Virkola, Pertti; and Adlercreutz, Herman, 4,092,120, Cl. 23-253.0TP.

Osterwalder, Johann Martin, to General Dynamics Corporation Electronics Division. Traveling wave power combining apparatus. 4,092,616, Cl. 333-6.000.

Oswalt, Billy W.: *See—*
Booth, Vernard S.; and Oswalt, Billy W., 4,091,983, Cl. 229-15.000.

Otis Engineering Corporation: *See—*
Shannon, Frederick E., Jr.; and Laky, Tibor, 4,091,867, Cl. 166-77.000.

Otsuka Koki Co., Ltd.: *See—*
Ishigami, Hiroyuki, 4,092,012, Cl. 254-126.000.

Ottmann, Gerhard Friedrich: *See—*
Bergk, Berndt; Lilienbeck, Klemens; Ottmann, Gerhard Friedrich; Stolzenbach, Heinrich; Wramba, Herbert; and Wulff, Walter, 4,092,202, Cl. 156-331.000.

Ouchi, Norman Ken, to International Business Machines Corporation. System for recovering data stored in failed memory unit. 4,092,732, Cl. 364-900.000.

Ours, David C.: *See—*
Bojas, Edward J.; and Ours, David C., 4,091,717, Cl. 91-498.000.

Outboard Marine Corporation: *See—*
Burmeister, Dennis N.; and Yourich, Adolph J., 4,091,788, Cl. 123-185.0BA.

Overman AB: *See—*
Schoblom, Svante, 4,092,049, Cl. 297-440.000.

Owen, Charles Edward: *See—*
Barclay, Donald John; Bird, Colin Leonard; Hallett, Michael Henry; Kirkman, David Horrobin; Minshull, John Francis; and Owen, Charles Edward, 4,092,637, Cl. 340-324.00R.

Owens, Frank R.: *See—*
Smith, Gerald D.; and Owens, Frank R., 4,092,692, Cl. 361-94.000.

Owens-Illinois, Inc.: *See—*
Bieringer, Robert J.; and Mather, George R., Jr., 4,091,796, Cl. 126-270.000.
Frederick, Judson G.; Mercer, Benjamin, Jr.; and Poole, John E., 4,092,447, Cl. 427-286.000.
Heckman, Russell William; and Nickey, George Allen, 4,092,382, Cl. 264-25.000.
Stoll, Andrew Joseph, III, 4,091,960, Cl. 220-304.000.

Oxenburg, Samuel. Hospital mattress with removable insert. 4,091,480, Cl. 5-91.000.

Oxley, Arthur R., to Advance Weight Systems, Inc. Weight sensing apparatus. 4,091,885, Cl. 177-188.000.

Oyama, Katsuyoshi: *See—*
Ohsako, Kyoichi; and Oyama, Katsuyoshi, 4,092,533, Cl. 250-231.0SE.

Ozawa, Akio: *See—*
Ishikawa, Katsumi; and Ozawa, Akio, 4,092,693, Cl. 361-103.000.

P. J. Zweegers end Zonen Landbouwmachinefabriek B.V.: *See—*
Steketee, Cornelius Jan, 4,091,878, Cl. 172-147.000.

P. R. Mallory & Co. Inc.: *See—*
Dey, Arabinda N.; and Bro, Per, 4,092,464, Cl. 429-127.000.

Paccar Inc.: *See—*
Lemon, Lucien W., 4,091,743, Cl. 105-375.000.

Pacific Clay Products: *See—*
Dye, Homer S.; and Hamner, Lloyd V., 4,092,092, Cl. 425-291.000.

Paciorek, Kazimiera Jola Liliana: *See—*
United States of America, National Aeronautics and Space Administration; and Paciorek, Kazimiera Jola Liliana, 4,092,466, Cl. 526-13.000.

Padovani, Francois A.; Miller, Michael Brant; Moore, James A.; Fowler, James H.; June, Malcolm Neville; Matthews, James D.; Morton, T. R.; Stotko, Norbert A.; and Palmer, Lewis B., to Texas Instruments Incorporated. Process of refining impure silicon to produce purified electronic grade silicon. 4,092,446, Cl. 427-213.000.

Pakord Ltd.: *See—*
Aspin, Anthony Frank, 4,091,607, Cl. 57-140.00R.

Palma, Gary E.: *See—*
Joslin, Frederick R.; Palma, Gary E.; and Whitney, Gary L., 4,092,515, Cl. 219-121.0LM.

Palmer, Lewis B.: *See—*
Padovani, Francois A.; Miller, Michael Brant; Moore, James A.; Fowler, James H.; June, Malcolm Neville; Matthews, James D.; Morton, T. R.; Stotko, Norbert A.; and Palmer, Lewis B., 4,092,446, Cl. 427-213.000.

Panetti, Romolo, to Speno International S.A. Process and apparatus for truing the head of rails of a railway. 4,091,578, Cl. 51-178.000.

Panex, Inc.: *See—*
Delatorre, Leroy C., 4,091,683, Cl. 73-718.000.

Pao, Chia Tung; and Green, Walter K., to General Electric Company. Radiation monitor. 4,092,539, Cl. 250-336.000.

Papay, Andrew George: *See—*
Lowe, Alexander George; Derbyshire, Philip Edward; and Papay, Andrew George, 4,092,341, Cl. 260-429.900.

Paraho Corporation: *See—*
Harris, Harry A.; and Jones, John B., Jr., 4,092,128, Cl. 48-197.00R.

Parrish, Thomas D., to Rockwell International Corporation. Repair clamp application tool. 4,091,694, Cl. 81-9.300.

Parrondo, Henry, to Ideal Corporation. Flasher inductance circuit. 4,092,563, Cl. 315-200.00A.

Parsons, George H., Jr.; and Eller, Thomas, to Baxter Travenol Laboratories, Inc. Labeled 5,5-diphenylhydantoin derivatives for radioimmunoassay. 4,092,479, Cl. 548-312.000.

Parsson, Nils Owe; and Dymling, Hans Harald, to Saab-Scania AB. Process for the production of articles of cellular plastic provided with a covering of another material. 4,092,387, Cl. 264-46.600.

Pascaud, Xavier: *See—*
Malen, Charles; Roger, Pierre; Poignant, Jean-Claude; and Pascaud, Xavier, 4,092,423, Cl. 424-274.000.

Patch, Edward, to Evans Products Company. Cross bar end fitting. 4,091,745, Cl. 105-498.000.

Patentkonsortiet Robert Meinich & Co.: *See—*
Bergersen, Hans Amund, 4,092,626, Cl. 338-212.000.

Paton, Neil E.; and Hamilton, C. Howard, to Rockwell International Corporation. Method of imparting a fine grain structure to aluminum alloys having precipitating constituents. 4,092,181, Cl. 148-12.70A.

Patrichi, Mihai D., to Networks Electronic Corp. Pyrotechnic piston actuator. 4,091,621, Cl. 60-635.000.

Patterson, Terence Neil: *See—*
Nijman, John Peter; and Patterson, Terence Neil, 4,091,530, Cl. 29-749.000.

Patterson, Thomas P. Tile setting apparatus. 4,091,945, Cl. 214-309.000.

Paul Troester Maschinenfabrik: *See—*
Koch, Klaus, 4,092,015, Cl. 366-81.000.

Pavlin, Cyrille F.: *See—*
Pierlot, Michel E.; and Pavlin, Cyrille F., 4,092,380, Cl. 261-69.00R.

Pazmany, Ladislao. Emergency shut-off valve. 4,091,831, Cl. 137-38.000.

Pearl, David R., to Gerber Garment Technology, Inc. Cutting machine having roller blade guide. 4,091,701, Cl. 83-747.000.

Peddinghaus, Gunther; Neumann, Harry; and Wittenstein, Horst, to A.G. fur Industrielle Elektronik AGIE b. Locarno. Apparatus for making a tool electrode for electrical discharge machining. 4,092,091, Cl. 425-62.000.

Peelman, Harold E.: *See—*
Langford, Obie M.; and Peelman, Harold E., 4,092,545, Cl. 250-501.000.

Pelster, Edwin Joseph; Kipers, Richard Franc; and Kilner, George Earl, to Filper Corporation. Netting bag machine and method. 4,091,595, Cl. 53-14.000.

Pennsylvania Pacific Corporation: *See—*
Craven, Daniel R., 4,091,950, Cl. 217-47.000.

Pepenko, Vladimir Danilovich: *See—*
Goldring, Grigory Mikhailovich; Koiler, Semen Nusievich; Losev, Vladimir Fedorovich; Pepenko, Vladimir Danilovich; Platov, Evgeny Ivanovich; Rabinovich, Benedikt Veniaminovich; and Sakhanovich, Jury Viktorovich, 4,091,858, Cl. 164-212.000.

Pereyaslavtsev, Nikolai Alexandrovich: *See—*
Genis, Semen Naumovich; Zhivov, Adolf Nikolaevich; Pereyaslavtsev, Nikolai Alexandrovich; Sukhenko, Igor Vladimirovich; Vasyagina, Nadezhda Grigorievna; and Shotsky, Viktor Ivanovich, 4,091,583, Cl. 52-81.000.

Petersen, Gary L.; and Holtrop, John W., to United States of America, Navy. Rotary bolt liquid propellant gun. 4,091,711, Cl. 89-7.000.

Peterson, Dean R.: *See—*
Vogel, Kenneth E.; and Peterson, Dean R., 4,091,637, Cl. 62-276.000.

Peterson, John A.: *See—*
Bell, Frank H.; Borcherding, Ronald L.; Munson, William O.; McDonald, Michael S.; and Peterson, John A., 4,091,729, Cl. 102-38.000.
Peterson, Samuel F., to Associated Mills, Inc. Retainer clamp. 4,091,998, Cl. 239-283.000.
Petrangelo, Amedio D., to Stromberg-Carlson Corporation. Simplified rack for electronic components. 4,092,699, Cl. 361-415.000.
Petry, Charles J.: *See—*
Dompas, John M.; and Petry, Charles J., 4,092,155, Cl. 75-124.000.
Peytavin, Pierre, to Vallourec (Usines a Tubes de Lorraine-Escaut et Vallourec Reunies). Rolling mill for forming seamless tubes, and seamless tube-making apparatus comprising such a mill. 4,091,650, Cl. 72-209.000.
Pfister, Rudolf: *See—*
Sallmann, Alfred; and Pfister, Rudolf, 4,092,430, Cl. 424-324.000.
Pfizer Inc.: *See—*
Bianco, Ernest J., 4,092,315, Cl. 544-291.000.
Plattner, Jacob J., 4,092,349, Cl. 260-516.000.
Pfliegel, Todor: *See—*
Farkas, Lorand; Nogradi, Mihaly; Pfliegel, Todor; Antus, Sandor; and Gottsegen, Agnes, 4,092,346, Cl. 260-511.000.
Philips Roxane, Inc.: *See—*
Cortner, William C., Jr.; and Daniels, Rogers C., 4,091,809, Cl. 128-163.000.
Phillips, Hedrick M. Safety warning system for an LP gas transport vehicle. 4,091,848, Cl. 141-94.000.
Phillips Petroleum Company: *See—*
Fozzard, George B., 4,092,257, Cl. 252-66.000.
Hofferber, James A.; and Webb, Paul U., 4,092,722, Cl. 364-500.000.
Reusser, Robert E., 4,092,262, Cl. 252-171.000.
Uraneck, Carl A.; Burleigh, John E.; and Marrs, Oren L., 4,092,465, Cl. 526-1.000.
Uraneck, Carl A.; and Solomon, Paul W., 4,092,469, Cl. 526-184.000.
Phillips, William A., to Granco Equipment, Inc. Drying oven. 4,092,100, Cl. 432-72.000.
Physics International Company: *See—*
Godfrey, Charles S.; and Moore, E. T., Jr., 4,091,870, Cl. 166-299.000.
Pick, Richard D.: *See—*
Narayan, Kailash; and Pick, Richard D., 4,092,399, Cl. 423-7.000.
Pickett, Oscar A., Jr.; and Stoddard, John W., to Monsanto Company. Phosphorus-containing copolyamides and fibers thereof. 4,092,302, Cl. 260-78.00R.
Pickup, Joseph: *See—*
Green, Douglas Harry; and Pickup, Joseph, 4,092,642, Cl. 340-413.000.
Picquendar, Jean-Edgar; and Sokoloff, Boris, to Thomson-CSF. Computer for computing a discrete Fourier transform. 4,092,723, Cl. 364-726.000.
Pierlot, Michel E.; and Pavlin, Cyrille F., to Societe Industrielle de Brevets et d'Etudes S.I.B.E. Carburetors for internal combustion engines. 4,092,380, Cl. 261-69.00R.
Pilkington Brothers Limited: *See—*
Ellis, Edric; Gelder, Richard; and Hale, Allan, 4,092,174, Cl. 106-53.000.
Pilkington, Mary W.: *See—*
Berni, Ralph J.; Benerito, Ruth R.; and Pilkington, Mary W., 4,092,106, Cl. 8-115.700.
Pinder, Russell Stuart, to Orr, Thomas. Transducers. 4,091,803, Cl. 128-2.05P.
Pinot, Jean-Pierre: *See—*
Gaignoux, Daniel Clement; and Pinot, Jean-Pierre, 4,092,111, Cl. 21-93.000.
Pinto, Frank George; and Kaplan, Earl, to American Cyanamid Company. Use of methylenebis- and thiobisnaphthols as promoters in tire cord adhesion to rubber. 4,092,455, Cl. 428-295.000.
Pioneer Electronic Corporation: *See—*
Ando, Shizuo; and Mizuno, Hiroshi, 4,092,496, Cl. 179-6.00R.
Ishikawa, Katsumi; and Ozawa, Akio, 4,092,693, Cl. 361-103.000.
Murata, Motomu, 4,092,572, Cl. 318-138.000.
Pioneer Heddle and Reed Company Incorporated: *See—*
Underwood, James L., 4,091,844, Cl. 139-91.000.
Pirck, Dietrich: *See—*
Humbert, Heiko; Fuchs, Gundolf; and Pirck, Dietrich, 4,092,298, Cl. 260-75.00T.
Piskoti, Charles, to SWS Silicones Corporation. Coating for rubber articles. 4,092,279, Cl. 260-8.000.
Pittas, Andrew Christo, to Pittas Engineering Designs Limited. Assembly kit for erecting demountable frame structures. 4,092,032, Cl. 280-30.000.
Pittas Engineering Designs Limited: *See—*
Pittas, Andrew Christo, 4,092,032, Cl. 280-30.000.
Place, Harry, to International Telephone & Telegraph Corporation. Confirmation circuit for a two-way communication system. 4,092,597, Cl. 325-53.000.
Plant, David William; and Williams, David John, to Imperial Chemical Industries Limited. Triphendioxazine triazinyl dyes having phosphonic acid groups. 4,092,478, Cl. 544-76.000.
Plante, Theophile: *See—*
Demazeau, Gerard; Maestro, Patrick; Plante, Theophile; Pouchard, Michel; and Hagenmuller, Paul, 4,092,439, Cl. 423-607.000.
Plastic Products, Inc.: *See—*
Jacobs, Lawrence O'Quinn, 4,091,857, Cl. 160-330.000.
Platner, David K., to Rockwell International Corporation. Stabilized fluid railway car suspension. 4,091,738, Cl. 105-164.000.
Platov, Evgeny Ivanovich: *See—*
Goldring, Grigory Mikhailovich; Koiler, Semen Nusievich; Losev, Vladimir Fedorovich; Pepenko, Vladimir Danilovich; Platov, Evgeny Ivanovich; Rabinovich, Benedikt Veniaminovich; and Sakhanovich, Jury Viktorovich, 4,091,858, Cl. 164-212.000.
Plattner, Jacob J., to Pfizer Inc. 11-Desoxy-15-thiaprostaglandins. 4,092,349, Cl. 260-516.000.
Plattner, Werner, administrator: *See—*
Winter, Werner; Thiel, Max; Stach, Kurt, deceased; Roesch, Androniki; Plattner, Werner, administrator; and Schaumann, Wolfgang, 4,092,416, Cl. 424-250.000.
Plymatic: *See—*
Zuccaro, Robert; and Lory, Pierre, 4,091,467, Cl. 2-192.000.
Pneumo Corporation: *See—*
Bradley, Charles Duane, Jr., 4,092,080, Cl. 403-319.000.
Poignant, Jean-Claude: *See—*
Malen, Charles; Roger, Pierre; Poignant, Jean-Claude; and Pascaud, Xavier, 4,092,423, Cl. 424-274.000.
Polaroid Corporation: *See—*
Bushey, Robert D.; and McCole, Thomas P., 4,092,167, Cl. 96-76.00C.
Polhemus, John T.: *See—*
United States of America, National Aeronautics and Space Administration; Polhemus, John T.; Morgan, Joseph E.; and Mandell, Arthur, 4,092,633, Cl. 340-213.00R.
Politechnika Gdanska: *See—*
Gruszecki, Wojciech; Bordwski, Edward; Gumieniak, Jerzy; Gumieniak, Malgorzata; Smulkowski, Maciej; Wojciechowska, Hanna; and Bobrowski, Miroslaw, 4,092,335, Cl. 260-348.440.
Polysius AG: *See—*
Thiesler, Ingo; Weiner, Max; and Steffens, Karl, 4,091,750, Cl. 110-329.000.
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Potter, David Walter, to Trans Canada Pipelines Limited. Pipeline limit dent detector. 4,091,678, Cl. 73-432.00R.
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PPG Industries, Inc.: *See—*
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Preuss, Friedrich; and Difflipp, Kurt, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Side-registering device. 4,092,022, Cl. 271-236.000.
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Lewis, William Platt, 4,092,388, Cl. 264-75.000.
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Proud, William H., to Hughes Aircraft Company. Rador jammer homing circuit. 4,092,645, Cl. 343-18.00E.
Psaras, John D., to Brown & Williamson Tobacco Corporation. Method and apparatus for conditioning material utilizing airflow control means. 4,091,824, Cl. 131-135.000.
Puel, Jean-Pierre, to Realist, Inc. Projectors. 4,092,064, Cl. 353-79.000.
Puskas, Ferenc, to Chemokomplex Vegyipari Gepes Berendezes Export-Import Vallalat. Vapor discharge lamp cermet electrode-closure and method of making. 4,092,560, Cl. 313-244.000.
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Puyplat, Olivier, to Cibie Projecteurs. Accessory headlamp mountings. 4,092,528, Cl. 362-427.000.
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Amedei, Giuseppe; Quilico, Carlo Alberto; and Maggioni, Virginio, 4,092,047, Cl. 303-22.00R.
Quinn, James M., to Raymond Lee Organization, Inc., The, a part interest. Linear electric generating system. 4,092,554, Cl. 310-13.000.
Rabiner, Lawrence Richard; and Sambur, Marvin Robert, to Bell Telephone Laboratories, Incorporated. Speech recognition system. 4,092,493, Cl. 179-1.0SD.
Rabinovich, Benedikt Veniaminovich: *See*—
Goldring, Grigory Mikhailovich; Koiler, Semen Nusievich; Losev, Vladimir Fedorovich; Pepenko, Vladimir Danilovich; Platov, Evgeny Ivanovich; Rabinovich, Benedikt Veniaminovich; and Sakhanovich, Jury Viktorovich, 4,091,858, Cl. 164-212.000.
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Radler, Richard W., Jr.; Millonzi, Richard P.; and Bergfjord, John A., to Xerox Corporation. Inorganic photoconductors with phenyl substituted image transport materials. 4,092,161, Cl. 96-1.50R.
Raeder, Johan Nils Eskil. Push button switch or keyboard assembly having flexible wire contacts. 4,092,503, Cl. 200-5.00A.
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Rampe, John F., to Rampe Research. Bowl-type vibratory finishing machine. 4,091,575, Cl. 51-163.200.
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Rapp, Wolfgang; and Schmidt, Dieter, to Daimler-Benz Aktiengesellschaft. Injection device for injecting an additional, small fuel quantity into an external auto-ignition internal combustion engine operating according to the stratified-charge principle. 4,091,771, Cl. 123-32.0SP.
Rasmussen, Donald Edgar; and Hof, Peter John, Jr., to United States of America, Interior. Self-contained instrument for measuring subterranean tunnel wall deflection. 4,091,990, Cl. 234-115.000.
Rasmussen, Glenn O., to Litton Systems, Inc. Stirrer hub assembly. 4,092,513, Cl. 219-10.55F.
Raudonis, John Anthony; and Mead, Richard, to Singer Company, The. Carriage reversing control for a flat bed knitting machine. 4,091,642, Cl. 66-76.000.
Ray, William A. Thermopile construction. 4,092,177, Cl. 136-220.000.
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Brooks, Philip Lee, 4,092,193, Cl. 156-83.000.
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Ayotte, Gordon, 4,091,534, Cl. 30-120.200.
Benroth, Emory E., 4,092,005, Cl. 241-168.000.
Bernardo, Anthony J., 4,091,928, Cl. 206-575.000.
Clark, Madalin M., 4,091,805, Cl. 128-41.000.
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White, Benjamin J.; Moreau, George; and Dworkin, Robert E., 4,092,610, Cl. 330-207.00A.
RCA Corporation: *See*—
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Baltzer, Philip Keene, 4,092,728, Cl. 364-900.000.
Ettenberg, Michael, 4,092,659, Cl. 357-18.000.
Goodman, Alvin Malcolm; and Weitzel, Charles Edward, 4,091,527, Cl. 29-571.000.
Ipri, Alfred Charles, 4,092,209, Cl. 156-628.000.
Kaplan, Leonard Abraham, 4,092,609, Cl. 330-149.000.
Lockwood, Harry Francis; and Kressel, Henry, 4,092,561, Cl. 313-499.000.
Schade, Otto Heinrich, Jr., 4,092,612, Cl. 330-288.000.
Sorkin, Howard, 4,091,847, Cl. 141-7.000.
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Rectenwald, Charles Edward; and Hinckley, Henry Bishop, to Union Carbide Corporation. Process for the purification of by-product hydrogen chloride streams. 4,092,403, Cl. 423-488.000.
Reddy, Thomas J. Band tightening and securing tool. 4,091,511, Cl. 24-273.000.
Redman, Hallie G. Tooth pillow. 4,091,481, Cl. 5-337.000.
Redmond, Stephen L.; and Fowler, Steven E., to United States of America, Navy. Aircraft to weapon fuze communication link. 4,091,734, Cl. 102-70.20R.
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Deane, Thomas N., 4,092,242, Cl. 210-23.00F.
Reed, Homer Charles, to Kerr-McGee Corporation. Process for treating oil shales. 4,092,237, Cl. 208-11.00R.
Reed, Russell, Jr., to United States of America, Navy. Modification of ballistic properties of HMX by spray drying. 4,092,383, Cl. 264-3.00C.
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Reid, F. Joseph; and Kim, Han J., to GTE Laboratories Incorporated. Process for preparing silver-cadmium oxide alloys. 4,092,157, Cl. 75-206.000.
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Hauck, Frederic Peter; Reid, Joyce; Narayanan, Venkatachala L.; Cimarusti, Christopher M.; Haugwitz, Rudiger D.; and Sundeen, Joseph E., 4,092,318, Cl. 260-293.560.
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Reischl, Artur; Jabs, Gert; Dietrich, Werner; and Gonzalez-Dorner, Alberto Carlos, to Bayer Aktiengesellschaft. Polyurethane resins prepared from active hydrogen containing material which is a dispersion of polyisocyanate-polyaddition products in hydroxyl containing compounds as dispersing agents. 4,092,275, Cl. 260-2.5BD.
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Rhodes, Charles Wesley; and Crosby, Philip Stephen, to Tektronix, Inc. Monochrome presentation of demodulated color signals. 4,092,666, Cl. 358-10.000.
Rhodes, Charles Wesley; and Jurgensen, David James, to Tektronix, Inc. Video transmission stabilization system. 4,092,674, Cl. 358-186.000.
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Richer, John Wilfred, to International Computers Limited. Method of manufacturing silicon integrated circuits utilizing selectively doped oxides. 4,092,185, Cl. 148-175.000.
Richter, Christian, to Messerschmitt-Bolkow-Blohm GmbH. Pump for an artificial heart. 4,091,471, Cl. 3-1.700.

Richter, Johan C. F. C.; and Richter, Ole Johan, to Kamyr Aktiebolag. Selective impregnation of heterogenous fiber material before digestion. 4,092,212, Cl. 162-19.000.
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Richter, Johan C. F. C.; and Richter, Ole Johan, 4,092,212, Cl. 162-19.000.
Ridgway, H. Curtis, to Telsco Industries, Inc. Rotary sprinkler arc adjustment. 4,091,997, Cl. 239-206.000.
Riecke, Roy C. Rigid metal conduit union. 4,091,523, Cl. 29-526.00R.
Riegler, Ernst; and Schmidt, Manfred, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Bearing arrangement for a tilting trunnion of a metallurgical vessel. 4,092,053, Cl. 308-3.00R.
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Riggins, James L. Work table. 4,091,601, Cl. 53-390.000.
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Buchner, Norbert; and Brose, Werner, 4,091,930, Cl. 206-605.000.
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Frankel, Milton B.; and Ogimachi, Naomi N., 4,092,336, Cl. 260-348.450.
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Hodge, Richard M., 4,092,644, Cl. 343-5.00W.
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Olkowski, Stanley, Jr.; and McElwain, John Christee, 4,091,640, Cl. 64-4.000.
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Roger, Pierre: *See*—
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Rohde, Wilhelm, to Linde Aktiengesellschaft. Process and apparatus for the low-temperature separation of air. 4,092,131, Cl. 55-33.000.
Rohrborn, Hans-Joachim; Homann, Rainer; Conrady, Heribert; and Menzel, Dieter, to Metallgesellschaft Aktiengesellschaft. Producing iron oxide weighting materials for drilling fluids. 4,092,407, Cl. 423-633.000.
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Austin, Buddy Julian, 4,092,511, Cl. 219-10.49R.
Rose, Leon; and Mandras, Christian, to Societe Metallurgique de Revigny. Drawing, straightening, sectioning and polishing machine. 4,091,651, Cl. 72-289.000.
Rosen, Carl-David. Wind-control rudder for yachts. 4,091,758, Cl. 114-144.00C.
Rosenbaum, Walter Steven; and Tanner, Howard Carl, to International Business Machines Corporation. Apparatus for automatically forming hyphenated words. 4,092,729, Cl. 364-900.000.
Rosenberg, Arnold Morry; and Gaidis, James Michael, to W. R. Grace & Co. Method for corrosion inhibition of reinforced bridge structures. 4,092,109, Cl. 21-2.50R.
Ross, Francis Joseph, to Du Pont de Nemours, E. I., and Company. Electrolytic cell. 4,092,228, Cl. 204-68.000.
Ross, Joseph A. Radiant energy recording apparatus. 4,092,655, Cl. 354-124.000.
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Ruehl, William E., to Illinois Tool Works Inc. Audible vibratory reed assembly. 4,091,762, Cl. 116-70.000.
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Rundel, Morton Stanley; and Keller, Frank R., to Gould, Inc. Modular electrical control station with switch detent means. 4,092,508, Cl. 200-291.000.
Rupe, Chauncey Orvis; and Bauer, Robert, to Miles Laboratories, Inc. Method, device and test reagent for detecting free available chlorine in aqueous fluids. 4,092,115, Cl. 23-230.00R.
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Ruppert, Henry C. Switch block. 4,092,547, Cl. 307-113.000.
Russell, Jerry C., Jr., to International Video Corporation. Anthropomorphic shoulder mount. 4,091,975, Cl. 224-5.00V.
Russo, Saverio; Bianchi, Estella; Ciferri, Alberto; Valenti, Barbara; and Bonta, Giorgio, to Consiglio Nazionale Delle Richerche. Anionic polymerization of lactam with catalyst, activator and lithium halide. 4,092,301, Cl. 260-78.00L.
Rutherford, Harry Wayne. Method of repairing water tanks. 4,091,518, Cl. 29-401.00F.
Rutishauser, Heinz; and Siroky, Otakar, to Mettler Instrumente AG. Titration apparatus. 4,092,121, Cl. 23-253.00R.
Ryan, Carl R., to United States of America, National Aeronautics and Space Administration. Quadraphase demodulation. 4,092,606, Cl. 329-124.000.
Ryan, William Francis, to Garrett Corporation, The. Fluidic servo-system and method. 4,091,716, Cl. 91-49.000.
Ryer, Jack; and Dooley, Martin F., to Exxon Research & Engineering Co. Anti-dieseling additive for spark ignition engines. 4,092,127, Cl. 44-63.000.
Ryunoshin, Takemi. Collapsible helmet. 4,091,470, Cl. 2-410.000.
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Moot, Willem H., 4,091,589, Cl. 52-573.000.
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Takahashi, Ryohei; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; and Sakashita, Nobuyuki, 4,092,151, Cl. 71-94.000.
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Goldring, Grigory Mikhailovich; Koiler, Semen Nusievich; Losev, Vladimir Fedorovich; Pepenko, Vladimir Danilovich; Platov, Evgeny Ivanovich; Rabinovich, Benedikt Veniaminovich; and Sakhanovich, Jury Viktorovich, 4,091,858, Cl. 164-212.000.
Sakuma, Isamu; Yonezu, Hiroo; Nishida, Katsuhiko; Kamejima, Taibun; Yuasa, Tonao; Ueno, Masayasu; Uji, Toshio; Nannichi, Yasuo; and Hayashi, Izuo, to Nippon Electric Co., Ltd. Semiconductor laser device equipped with a silicon heat sink. 4,092,614, Cl. 331-94.50P.
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Sakurai, Eishiro, to Toyo Seikan Kaisha Ltd. Method of blow molding and then exhausting hollow plastic articles. 4,092,389, Cl. 264-89.000.
Sallmann, Alfred; and Pfister, Rudolf, to Ciba-Geigy Corporation. Antiphlogistic phenylacetohydroxamic acid compositions. 4,092,430, Cl. 424-324.000.
Salmon, Mario, to Ing. C. Olivetti & C., S.p.A. Autoadaptive working center for programmable automation. 4,092,719, Cl. 364-468.000.
Salzano, Francis J.: *See*—
Berlad, Abraham L.; Salzano, Francis J.; and Batey, John E., 4,091,592, Cl. 52-616.000.
Sambur, Marvin Robert: *See*—
Rabiner, Lawrence Richard; and Sambur, Marvin Robert, 4,092,493, Cl. 179-1.0SD.
Sandell, Bertil. Method for preparing fibres for mixing into a sprayed concrete mass and a device for performing the method. 4,092,737, Cl. 366-3.000.
Sander, Willy M., to Dictaphone Corporation. Apparatus for variably selecting the capacity of a recording medium in a recording system. 4,092,679, Cl. 360-71.000.
Sander, Willy M., to Dictaphone Corporation. Apparatus for indicating the farthest advance position of a bi-directionally movable medium. 4,092,680, Cl. 360-72.000.
Sander, Willy M.; and Debaudringhien, Andre T., to Dictaphone Corporation. Cassette changer apparatus having priority eject. 4,092,685, Cl. 360-92.000.
Sanders, Raymond H.: *See*—
Griffo, Gregory; and Sanders, Raymond H., 4,091,925, Cl. 206-423.000.
Sanderson, Gordon Francis; and Burge, Anthony George, to Automation Feeding Devices Pty Limited; and Tooheys Limited. Orienting and filling casks. 4,091,597, Cl. 53-59.00R.
Sandoz Ltd.: *See*—
Frigato, Giovanni, 4,091,834, Cl. 137-93.000.
Jotterand, Armand, 4,092,329, Cl. 260-329.0AM.
Sanitation Equipment Limited: *See*—
Hewson, Clifford Bruce; and Stewart, John M., 4,091,475, Cl. 4-321.000.
Sano, Takezo; Murase, Ichiki; Kobayashi, Akira, deceased; by Kobayashi, Shuko, successor; and by Kobayashi, Tsutomu, guardian, to Sumitomo Chemical Company, Limited. Filters for the selective collection of metallic ions. 4,092,250, Cl. 210-500.00M.
Sanraku Ocean Co., Ltd.: *See*—
Okamoto, Rokuro; Fukumoto, Tsumoru; Takamatsu, Akira; and Takeuchi, Tomio, 4,092,473, Cl. 536-17.000.
Santa Fe International Corporation: *See*—
Lloyd, Samuel Harry, III, 4,091,760, Cl. 114-264.000.
Saran, Amitabh, to Xerox Corporation. Method and means for extracting variable length data from fixed length bytes. 4,092,665, Cl. 358-261.000.
Saran, Amitabh, to Xerox Corporation. Truncated run length encoding with a modular variable length code format. 4,092,675, Cl. 358-261.000.
Saran, Amitabh, to Xerox Corporation. Block length multiple plus run length residue codes for run length encoding. 4,092,676, Cl. 358-261.000.
Saran, Amitabh, to Xerox Corporation. Truncated run length encoding for fractionally difference modulated video signals. 4,092,677, Cl. 358-261.000.
Sarkes Tarzian, Inc.: *See*—
Valdettaro, Alarico A., 4,091,513, Cl. 29-25.410.
Sarns, Inc.: *See*—
Amrine, Bruce A.; and Teders, Philip J., 4,091,672, Cl. 73-343.00R.
Sartorius-Werke GmbH: *See*—
Knothe, Erich; Berg, Christoph; and Stadler, Eberhard, 4,091,886, Cl. 177-210.0EM.
Sasaki, Hiroshi: *See*—
Oishi, Toshio; Kitano, Takashi; Sasaki, Hiroshi; and Yamashita, Tetuo, 4,092,283, Cl. 260-27.0BB.
Sasaki, Takehiko; and Maeda, Hidetoshi, to Sharp Kabushiki Kaisha. Switching mechanism for electronic wristwatch. 4,091,610, Cl. 58-23.00R.
Sato, Eiichi: *See*—
Tsuda, Hiroshi; Nishikawa, Masaji; Kimura, Katsuhiko; and Sato, Eiichi, 4,092,065, Cl. 355-8.000.
Sato, Mitsuhiro: *See*—
Shingaki, Masamitsu; Umemoto, Tomeo; Sato, Mitsuhiro; and Yuki, Mikio, 4,091,685, Cl. 74-331.000.
Sato, Toshiyuki; and Edo, Hideo, to Kabushiki Kaisha Suiken. Pipe junction holder. 4,092,036, Cl. 285-337.000.
Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Portable label printing machine. 4,091,728, Cl. 101-288.000.
Satoh, Masaharu, to Sharp Kabushiki Kaisha. Key input means having a switching element made of a light emitting diode. 4,092,640, Cl. 340-365.00R.
Satomi, Koji: *See*—
Izawa, Tetsuo; Kajikawa, Shuji; Satomi, Koji; Nakano, Koichiro; Kurosawa, Shinichi; Hirai, Keitaro; and Tsukada, Yuichi, 4,091,545, Cl. 34-9.000.
Satterwhite, Lawrence E.: *See*—
Motes-Conners, Corroll J.; and Satterwhite, Lawrence E., 4,091,514, Cl. 29-33.00T.
Saucy, Gabriel: *See*—
Cohen, Noal; and Saucy, Gabriel, 4,092,483, Cl. 560-255.000.
Saufferer, Helmut; and Willmann, Karl, to Daimler-Benz Aktiengesellschaft. Method and apparatus for influencing thermo-chemical reactions. 4,091,779, Cl. 123-119.00E.
Saulters, Cecil Clyde. Theft prevention switch device. 4,092,506, Cl. 200-42.00R.
Saumell, Jon. Pipe-cutting apparatus. 4,091,533, Cl. 30-95.000.
Savit, Carl H.: *See*—
Siems, Lee E.; Morgan, Paul M.; and Savit, Carl H., 4,092,629, Cl. 340-15.5TS.
Sawada, Toshio: *See*—
Ishikawa, Hitoshi; Yamamoto, Kimihiko; Sawada, Toshio; and Kasahara, Takahiko, 4,091,755, Cl. 112-279.000.
Sawada, Yoshio: *See*—
Kawasaki, Masahiro; Tano, Eiichi; and Sawada, Yoshio, 4,092,653, Cl. 354-60.00L.
Saxton, Forest J. Heat exchange system. 4,092,379, Cl. 261-25.000.
Sayigh, Adnan A. R.: *See*—
Frulla, Floro F.; Sayigh, Adnan A. R.; Ulrich, Henri; and Whitman, Peter J., 4,092,343, Cl. 260-453.0AM.
Schabert, Hans-Peter; and Laurer, Erwin, to Kraftwerk Union Aktiengesellschaft. Nuclear reactor installation. 4,092,214, Cl. 176-38.000.
Schabert, Hans-Peter; and Drossel, Rolf, to Kraftwerk Union Aktiengesellschaft. Nuclear reactor plant. 4,092,490, Cl. 176-38.000.
Schade, Otto Heinrich, Jr., to RCA Corporation. Amplifier circuits. 4,092,612, Cl. 330-288.000.
Schadow, Klaus C.; and Chieze, Don J., to United States of America, Navy. Fuel injection with flameholding. 4,091,731, Cl. 102-49.100.
Schadow, Klaus C., to United States of America, Navy. Fuel injection. 4,091,732, Cl. 102-49.300.
Schaeffer, Robert L., to General Electric Company. Extra capacity steam iron. 4,091,551, Cl. 38-77.830.
Schafer, Horst, to Semikron Gesellschaft fur Gleichrichterbau und Elektronik m.b.H. Semiconductor device. 4,092,663, Cl. 357-55.000.
Schaper, Peter: *See*—
Laing, Nikolaus; Schaper, Peter; and Heierli, Werner, 4,092,226, Cl. 204-51.000.
Schaub, Fred S.: *See*—
Heater, William R.; Schaub, Fred S.; and Kennedy, John R., 4,091,772, Cl. 123-32.0SP.
Schaumann, Wolfgang: *See*—
Winter, Werner; Thiel, Max; Stach, Kurt, deceased; Roesch, Androniki; Plattner, Werner, administrator; and Schaumann, Wolfgang, 4,092,416, Cl. 424-250.000.
Schekin, Vladimir Ivanovich: *See*—
Kostyrkin, Boris Vladimirovich; and Schekin, Vladimir Ivanovich, 4,091,859, Cl. 164-250.000.
Schellmann, Erhard: *See*—
Bocker, Ernst; Kracht, Wolfgang; Rupp, Roland; Schellmann, Erhard; Trescher, Viktor; and Ullrich, Martin, 4,092,089, Cl. 425-10.000.
Schenk, Walter; Schlecht, Helmut; and Gotsmann, Guenther, to BASF Aktiengesellschaft. 1-Chloro-prop-2-ene-3-sulfonic acid compounds and their manufacture. 4,092,347, Cl. 260-513.00R.
Scher, Herbert I.; Ungar, Israel S.; and Lex, Joseph A., to Exxon Research & Engineering Co. Process for high pressure decorative laminate having registered color and embossing and resultant product. 4,092,198, Cl. 156-222.000.
Scher, Herbert I.: *See*—
Ungar, Israel S.; Scher, Herbert I.; and Williams, Delbert A., 4,092,199, Cl. 156-222.000.
Schering Aktiengesellschaft: *See*—
Mueller, Karl Heinz, 4,092,342, Cl. 260-448.00A.
Schering Corporation: *See*—
Daniels, Peter J. L.; and Nafissi Varchei, Mohammad Mehdi, 4,092,359, Cl. 260-563.00R.
Scherrer, Fernand. Assembly system for frames. 4,092,076, Cl. 403-178.000.
Schetina, Otto: *See*—
Wrulich, Herwig; and Schetina, Otto, 4,091,692, Cl. 76-101.00R.
Schettler, Helmut: *See*—
Howard, Donald Dunbar; and Schettler, Helmut, 4,092,551, Cl. 307-254.000.
Scheuneman, James Herman, to Sperry Rand Corporation. Post-write address word correction in cache memory system. 4,092,713, Cl. 364-200.000.
Schiffelholz, Walter: *See*—
Fontana, Emilio; Fontana, Rocco; and Schiffelholz, Walter, 4,091,625, Cl. 61-35.000.
Schlager, John J.: *See*—
Von Kohorn, Henry, 4,092,634, Cl. 340-323.00R.

Schlatter, James M.: *See—*
Jones, David A., Jr.; Schlatter, James M.; Mikulec, Richard A.; and Reuter, Judith A., 4,092,304, Cl. 260-112.50R.
Schlecht, Helmut: *See—*
Schenk, Walter; Schlecht, Helmut; and Gotsmann, Guenther, 4,092,347, Cl. 260-513.00R.
Schlichting, Harold E., Jr. Apparatus for biologically monitoring air quality. 4,092,221, Cl. 195-127.000.
Schlichtmann, Gerhard: *See—*
Beck, Heinz; and Schlichtmann, Gerhard, 4,092,107, Cl. 8-116.00R.
Schlosberg, Richard H.; Maa, Peter S.; and Neavel, Richard C., to Exxon Research & Engineering Co. Treatment of coal by alkylation or acylation to increase liquid products from coal liquefaction. 4,092,235, Cl. 208-8.000.
Schlosser, Werner; and Berger, Horst, to Motoren- und Turbinen Union Munchen GmbH. Fixture for use in fabricating rings from separate segments. 4,092,018, Cl. 269-234.000.
Schlotzhauer, Allan T.: *See—*
Newman, Douglas A.; and Schlotzhauer, Allan T., 4,092,456, Cl. 428-307.000.
Schlumberger Technology Corporation: *See—*
Coates, George R., 4,092,583, Cl. 324-6.000.
Schlutz, Charles A. Continuous flow fractionation and separation device and method. 4,091,989, Cl. 233-14.00R.
Schmanski, Donald W., to HPC, Inc. Roadway/traffic delineator. 4,092,081, Cl. 404-10.000.
Schmid, Markus; and Marti, Heinrich, to Concast AG. Measuring apparatus for determining the position of the roller apron of a continuous casting installation. 4,091,542, Cl. 33-333.000.
Schmid, Wolfgang; Basler, Walter; and Burckhardt, Urs, to Ciba-Geigy Corporation. Microorganism combatting quinoxaline-di-N-oxide carboxamides. 4,092,415, Cl. 424-250.000.
Schmidt, Dieter: *See—*
Rapp, Wolfgang; and Schmidt, Dieter, 4,091,771, Cl. 123-32.0SP.
Schmidt, Erich, to Maschinenfabrik Zuckermann Komm. Ges. Machine for grinding the edge areas of formed parts. 4,091,573, Cl. 51-140.000.
Schmidt, Gustav A.: *See—*
Douek, Maurice; Schmidt, Gustav A.; Malofsky, Bernard M.; and Hauser, Martin, 4,092,374, Cl. 260-873.000.
Douek, Maurice; Schmidt, Gustav A.; Malofsky, Bernard M.; and Hauser, Martin, 4,092,376, Cl. 260-884.000.
Schmidt, Hans-Joachim: *See—*
Fernholz, Hans; Krekeler, Hans; Schmidt, Hans-Joachim; and Wunder, Friedrich, 4,092,267, Cl. 252-413.000.
Schmidt, Manfred: *See—*
Riegler, Ernst; and Schmidt, Manfred, 4,092,053, Cl. 308-3.00R.
Schmiesing, Gregory. Silo unloader. 4,091,940, Cl. 214-17.0DB.
Schmitt, James F.: *See—*
Thomson, Ronald E.; and Schmitt, James F., 4,091,492, Cl. 15-246.000.
Schmitt, Kirk D.: *See—*
Bridger, Robert F.; and Schmitt, Kirk D., 4,092,254, Cl. 252-49.800.
Schoblom, Svante, to Overman AB. Lightweight knocked-down chair design constructed of inexpensive components. 4,092,049, Cl. 297-440.000.
Schoeff, John A., to Precision Monolithics, Inc. Digital to analog converter with complementary true current outputs. 4,092,639, Cl. 340-347.0DA.
Schoeff, John A., to Motorola, Inc. Analog-to-digital converter system. 4,092,726, Cl. 364-829.000.
Schrenk, Lorenz P.; Datta, James R.; and Alden, David G., to Honeywell Inc. Automated instructional apparatus and method. 4,091,550, Cl. 35-19.00A.
Schroder, Johann, to U.S. Philips Corporation. Reversible latent heat storage method, and reversible latent heat accumulator. 4,091,863, Cl. 165-1.000.
Schroter, Herbert, to Hoechst Aktiengesellschaft. Photoprinting machine with a device for expelling excess ammonia-containing developer medium from developed diazotype paper. 4,092,658, Cl. 354-300.000.
Schuessler, John C.; and Tapp, David J., to Leach Corporation. Electrical connection for the moving contacts of a relay. 4,092,620, Cl. 335-128.000.
Schultz, Everett M.: *See—*
Cragoe, Edward J., Jr.; Schultz, Everett M.; and Stokker, Gerald E., 4,092,414, Cl. 424-248.510.
Schulz, Gordon, to Odetics, Inc. Tape withdrawal and tensioning mechanism for video cassette recorder/reproducer. 4,092,686, Cl. 360-95.000.
Schumacher, William Ludlow: *See—*
Grubb, Daniel Baker; Schumacher, William Ludlow; and Volinskie, Robert, 4,091,531, Cl. 29-749.000.
Schurr, Volker: *See—*
Wieland, Dieter; and Schurr, Volker, 4,091,896, Cl. 188-166.000.
Schutz, Hans Ulrich; and Buhler, Arthur, to Ciba-Geigy Corporation. Pyridyl azo aryl metal complex dyes. 4,092,307, Cl. 260-146.00R.
Schwartz, David O. Molding. 4,091,586, Cl. 52-287.000.
Schwarz, Gerhard: *See—*
Lang, Rudolf; and Schwarz, Gerhard, 4,092,656, Cl. 354-202.000.
Schwarzmann, Matthias: *See—*
Adolphi, Heinrich; Schwarzmann, Matthias; and Heinze, Peter, 4,092,110, Cl. 21-7.000.
Schweiger, Fritz; and Fritzsche, Wilfried, to Hochtemperatur-Kernkraftwerk GmbH (HKG) Gemeinsames Europaisches Unternehman. Fuel elements for nuclear reactors and method for testing the circulation of fuel elements in a core of a nuclear reactor. 4,092,217, Cl. 176-58.0PB.
Schwuger, Milan Johann: *See—*
Sperling, Gerhard; Jung, Dieter; Hachmann, Klaus; Schwuger, Milan Johann; and Smolka, Heinz, 4,092,261, Cl. 252-131.000.
Science Union et Cie., Societe Francaise de Recherche Medicale: *See—*
Malen, Charles; Roger, Pierre; Poignant, Jean-Claude; and Pascaud, Xavier, 4,092,423, Cl. 424-274.000.
SCM Corporation: *See—*
George, Kurudamannil A., 4,091,797, Cl. 126-270.000.
Oroshnik, William, 4,092,366, Cl. 568-824.000.
Uher, Joseph F., 4,092,159, Cl. 75-257.000.
Scorzo, Samuel P. Smoking article having an ignition suppression disk. 4,091,821, Cl. 131-4.00A.
Scriver, Robert Edmund, to Honeywell Information Systems Inc. Input-output unit having extended addressing capability. 4,092,715, Cl. 364-200.000.
Sea-Land Service, Inc.: *See—*
Liu, Diomedes, 4,091,759, Cl. 114-263.000.
Searight, Edward F.: *See—*
Lazaridis, Lazaros J.; Searight, Edward F.; and Shefsiek, Paul K., 4,091,801, Cl. 126-378.000.
Sears Manufacturing Company: *See—*
Koutsky, L. John, 4,092,009, Cl. 248-421.000.
Seely, John Hunter: *See—*
Mao, James Chieh-Hsia; Seely, John Hunter; and Fairgrieve, John Scott, 4,092,412, Cl. 424-212.000.
Seidel, Dieter, to Stieber Praezision GmbH. Roller clutch with centrifugal engager. 4,091,903, Cl. 195-105.0CF.
Seiko Koki Kabushiki Kaisha: *See—*
Onda, Eiichi; Koyama, Mitsuo; and Nakagawa, Tadashi, 4,092,657, Cl. 354-234.000.
Seilly, Alec Harry; and Lakra, Paul, to Lucas Industries Limited. Fuel injection systems for internal combustion engines. 4,091,784, Cl. 123-139.0AT.
Seitz, Max, to Carl Hurth Maschinen- und Zahnradfabrik. Drive mechanism for the spindle of a tool machine. 4,091,686, Cl. 74-409.000.
Sekino, Jun: *See—*
Murakami, Masuo; Kawahara, Shigemi; Kawata, Hiroitsu; Okazaki, Kiyoshi; Sekino, Jun; and Shimizu, Hidemi, 4,092,428, Cl. 424-317.000.
Sekino, Shozo: *See—*
Onoe, Yasumitsu; Matsumura, Yoshikazu; Katoh, Hiroshi; Nakajima, Koe; and Sekino, Shozo, 4,092,178, Cl. 148-2.000.
Seko, Maomi: *See—*
Miyake, Tetsuya; Seko, Maomi; Takeda, Kunihiko; Ikeda, Akihiko; and Imamura, Kazuo, 4,092,398, Cl. 423-7.000.
Selcuk, M. Kudret: *See—*
United States of America, National Aeronautics and Space Administration; and Selcuk, M. Kudret, 4,091,798, Cl. 126-271.000.
Seliborski, Janusz: *See—*
Karasiewicz, Czeslaw; and Seliborski, Janusz, 4,091,525, Cl. 407-1.000.
Selkow, Charles Fred, Jr., to Bell Telephone Laboratories, Incorporated. Contact protection test set. 4,092,587, Cl. 324-28.00R.
Semikron Gesellschaft fur Gleichrichterbau und Elektronik m.b.H.: *See—*
Schafer, Horst, 4,092,663, Cl. 357-55.000.
Sendo, Yuji: *See—*
Yoshioka, Mitsuru; Sendo, Yuji; and Murakami, Masayuki, 4,092,474, Cl. 544-17.000.
Senju Pharmaceutical Co., Ltd.: *See—*
Ogata, Kazumi; and Iwata, Shuzo, 4,092,410, Cl. 424-78.000.
Sensi, John E.: *See—*
Cerutti, Richard L.; Henry, Vincent I.; and Sensi, John E., 4,092,140, Cl. 65-99.00A.
Sensor-Matic, Inc.: *See—*
Abbott, Arthur Robert; and Milliken, Walter Clark, 4,091,682, Cl. 73-702.000.
Seps, Daniel. An apparatus using a pivoted weight mechanism for lifting the tone arm of a record player. 4,092,030, Cl. 274-1.00R.
Sequeira, Avilino, Jr.: *See—*
Mead, Theodore C.; Sequeira, Avilino, Jr.; and Odell, Norman R., 4,092,240, Cl. 208-301.000.
Sernaker, Howard, to Sernaker, Howard. Embroidery transfer. 4,092,451, Cl. 428-102.000.
Serpa, Leroy Jasper: *See—*
Olsen, Carlton Edward; and Serpa, Leroy Jasper, 4,092,166, Cl. 96-38.200.
Servco Company, a division of Smith International, The: *See—*
Weber, Robert W., 4,091,883, Cl. 175-287.000.
Severson, Ole Charles, to Viking Tool Company, The. Metal cutting tool with anvil-held indexible and replaceable cutter inserts. 4,092,082, Cl. 407-40.000.
Sexton, Arthur R.: *See—*
Stevens, Violete L.; Sexton, Arthur R.; and Corson, Frederick P., 4,092,339, Cl. 260-410.600.
Seydl, Wolfgang: *See—*
Theysohn, Rainer; Wurmb, Rolf; Seydl, Wolfgang; and Zahradnik, Franz, 4,092,284, Cl. 260-28.00R.
Shafer Valve Company: *See—*
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Shakhbazyan, Vyacheslav Georgievich: *See*—
Kostousov, Anatoly Ivanovich; Ionov, Valentin Vasilievich; Shakhbazyan, Vyacheslav Georgievich; and Terekhin, Vladimir Afanasievich, 4,091,714, Cl. 90-76.000.
Shannon, Frederick E., Jr.; and Laky, Tibor, to Otis Engineering Corporation. Flexible conduit injection system. 4,091,867, Cl. 166-77.000.
Sharp Kabushiki Kaisha: *See*—
Sasaki, Takehiko; and Maeda, Hidetoshi, 4,091,610, Cl. 58-23.00R.
Satoh, Masaharu, 4,092,640, Cl. 340-365.00R.
Suzuki, Chuji; Yasuda, Syoichi; and Nishioka, Yoshiki, 4,092,631, Cl. 340-146.30J.
Sharrit, David D., to Hewlett-Packard Company. Method and circuit for generating diamond markers. 4,092,567, Cl. 315-377.000.
Shaw, Robert F.; and Stutz, David E., to Shaw, Robert F. Surgical instrument having self-regulated electrical proximity heating of its cutting edge and method of using the same. 4,091,813, Cl. 128-303.140.
Sheehan, Richard V., to Raymond Lee Organization, Inc., The. Decorative toy. 4,091,565, Cl. 46-238.000.
Shefsiek, Paul K.: *See*—
Lazaridis, Lazaros J.; Searight, Edward F.; and Shefsiek, Paul K., 4,091,801, Cl. 126-378.000.
Shelby, Robert L.: *See*—
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Shell Oil Company: *See*—
Gatti, Anthony R.; Hokanson, James S.; and Nozaki, Kenzie, 4,092,126, Cl. 44-51.000.
Vreugdenhil, Arie D., 4,092,375, Cl. 260-876.00B.
Shelton, James A. Power assisted hand truck. 4,091,942, Cl. 214-148.000.
Shepherd, Mark, Jr., to Texas Instruments Incorporated. Protective alarm system for window using reflected microwave energy. 4,092,636, Cl. 340-274.00R.
Shepherd, Maurice William. Cryogenic device with heat input means. 4,091,634, Cl. 62-45.000.
Shim, Kyung S., to Stauffer Chemical Company. Process for preparing polyalkylene glycol alkyl or haloalkyl polyphosphonates. 4,092,377, Cl. 260-969.000.
Shimadzu Seisakusho Ltd.: *See*—
Fukuda, Yoshio; Suzuki, Jugoro; Fukuma, Toshiaki; and Takada, Michinosuke, 4,092,069, Cl. 356-88.000.
Shimizu, Akira, to Olympus Optical Company Limited. Method of and apparatus for stabilizing output light of a current modulation laser device whose output is changed by changing an anode current. 4,092,615, Cl. 331-94.50S.
Shimizu, Hidemi: *See*—
Murakami, Masuo; Kawahara, Shigemi; Kawata, Hiroitsu; Okazaki, Kiyoshi; Sekino, Jun; and Shimizu, Hidemi, 4,092,428, Cl. 424-317.000.
Shimizu, Kunitami; and Kaisaku, Yoshiro, to Suntory Ltd. Barrel storage and handling apparatus. 4,091,939, Cl. 214-16.40A.
Shimizu, Tutomu: *See*—
Kataoka, Seiji; Shimizu, Tutomu; and Katwuno, Kesao, 4,092,222, Cl. 202-227.000.
Shin-Etsu Chemical Co., Ltd.: *See*—
Arai, Shigeru; Ito, Kenichi; Ogawa, Kinya; Kurimoto, Kazuhiko; and Shirota, Yoshihiro, 4,092,471, Cl. 528-502.000.
Shin-Shirasuna Electric Corp.: *See*—
Nishikawa, Masao, 4,092,678, Cl. 360-31.000.
Shindo, Minoru: *See*—
Mori, Takashi; Takaku, Sakae; Oi, Nobuhiro; Shindo, Minoru; Hirano, Takeaki; Kataoka, Shigeyuki; and Furuno, Kouji, 4,092,431, Cl. 424-324.000.
Tanemura, Mitsuru; Shinozaki, Teizo; Shindo, Minoru; Hata, Shunichi; Mizuno, Koji; Ono, Masayoshi; Wakabayashi, Kiyoshige; Nakano, Toshiaki; Nishii, Yasuho; Matsuno, Takashi; and Ohsugi, Yoshiyuki, 4,092,426, Cl. 424-309.000.
Shingaki, Masamitsu; Umemoto, Tomeo; Sato, Mitsuhiro; and Yuki, Mikio, to Kubota, Ltd. Speed change unit for tiller. 4,091,685, Cl. 74-331.000.
Shinoda, Nobuhiko: *See*—
Ito, Tadashi; Ito, Fumio; Mashimo, Yukio; Sakurado, Nobuaki; and Shinoda, Nobuhiko, 4,092,652, Cl. 354-23.00D.
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Shipchandler, Mohammed T., to IMC Chemical Group, Inc. Process for production of substituted oxazolines. 4,092,326, Cl. 260-307.00F.
Shipchandler, Mohammed T., to IMC Chemical Group, Inc. Method of synthesis of 4,5,6-trihydroxyisophthalic acid. 4,092,351, Cl. 260-521.00P.
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Shiraishi, Tatsuo; Kishiwada, Susumu; and Nagaoka, Yoshihiko, to Sumitomo Chemical Company, Limited. Process for production of acrylic acid. 4,092,354, Cl. 260-530.00N.
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Arai, Shigeru; Ito, Kenichi; Ogawa, Kinya; Kurimoto, Kazuhiko; and Shirota, Yoshihiro, 4,092,471, Cl. 528-502.000.
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Sibilia, John P.; and Vrooman, Bernard Harlow, to Allied Chemical Corporation. Process for improving the ammonolytic stability of polyester textile yarn. 4,091,855, Cl. 152-359.000.
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Bauer, Lothar, 4,092,731, Cl. 364-900.000.
Birlmeier, Josef, 4,092,489, Cl. 178-3.000.
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Hoepfner, Joachim, 4,092,210, Cl. 156-643.000.
Stut, Hans, 4,092,124, Cl. 23-273.00R.
Widemann, Rudolf; and Ehrgott, Roland, 4,092,622, Cl. 336-192.000.
Wolk, Hermann, 4,092,593, Cl. 324-158.00F.
Siems, Lee E.; Morgan, Paul M.; and Savit, Carl H., to Western Geophysical Co. of America. Decentralized seismic data processing system. 4,092,629, Cl. 340-15.5TS.
Sieren, Gerald E.; Sippel, LLoyd F.; and VandenHeuvel, George A., to Allis-Chalmers Corporation. Sump oil transfer system. 4,091,905, Cl. 192-113.00B.
Signore, Dennis J.; and Stark, Forest G., to AVM Corporation. Locking device for file drawers. 4,092,056, Cl. 312-219.000.
Simco Company, Inc., The: *See*—
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Singer Company, The: *See*—
Herr, John Addison; and Jaffe, Wolfgang, 4,092,569, Cl. 318-35.000.
Johnson, Ralph Edward; and Rodda, Donald, 4,091,753, Cl. 112-184.000.
Koester, Richard H., 4,092,063, Cl. 353-71.000.
Odermann, Charles Robert, 4,091,752, Cl. 112-75.000.
Onembo, Eli N., 4,091,754, Cl. 112-200.000.
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Sircar, Jagadish C.; Kesten, Stephen J.; and Zinnes, Harold, to Warner-Lambert Company. 5,6-Dihydro-4-oxo-4H-thieno[2,3-b]thiopyran-5-carboxamides, and process for the preparation thereof. 4,092,325, Cl. 260-307.00H.
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Siwiec, Elaine C.; Van Oene, Henk; and Theodore, Ares N., to Ford Motor Company. Powder paint with epoxy copolymer with anhydride and hydroxy acids. 4,092,373, Cl. 260-830.00R.
Skiff, Russell A. Epoxy resin compositions. 4,092,296, Cl. 260-47.0EP.
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Skurka, James A.: *See*—
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Sliger, Boyd P., to Robertshaw Controls Company. Engine cooling system thermostat and method of making the same. 4,091,991, Cl. 236-34.500.
Sloan, Paul H., Sr., to Stant Manufacturing Company, Inc. Plastic filler neck cap. 4,091,955, Cl. 220-203.000.
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Smith, Gerald D.; and Owens, Frank R., to Carson Manufacturing Company. Overload protection circuit. 4,092,692, Cl. 361-94.000.
Smith International, Inc.: *See*—
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Smith, Kinnaman Browning: *See*—
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Smith, Michael P., to Texaco Inc. Method for detecting cement voids or borehole washouts. 4,092,536, Cl. 250-265.000.
Smith, Ray E., to Velsicol Chemical Corporation. Durable flame retardant finishes for textile materials. 4,092,251, Cl. 252-8.100.
Smith, Robert L.: *See*—
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Smith, William E., to Dow Chemical Company, The. Caustic hydrolysis of chlorobenzene to diphenyl oxide. 4,092,364, Cl. 260-612.00R.
Smith, William E., to General Electric Company. Vapor phase transesterification. 4,092,368, Cl. 568-877.000.

SmithKline Corporation: *See—*
Berkoff, Charles E.; and Webb, Robert Lee, 4,092,352, Cl. 260-521.00H.
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Smithline, Leonard M., to Lansing Research Corporation. Tuning of etalons in spectroscopic apparatus. 4,092,070, Cl. 356-106.00S.
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Snyder, David E.; Locke, Joe B.; and Brabits, William C., to U.S. Industries, Inc. Valve. 4,091,832, Cl. 137-72.000.
Sobeck, Gerald A. Rack assembly for a land vehicle. 4,092,050, Cl. 298-18.000.
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Carre, Jean-Jacques; and Muterel, Roland, 4,091,619, Cl. 60-553.000.
Monpetit, Louis; and Hamelin, Gilbert, 4,091,777, Cl. 123-97.00B.
Societe Anonyme des Elevateurs Lateraux: *See—*
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Societe Internationale pour l'Innovation: *See—*
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Societe Metallurgique de Revigny: *See—*
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Soerensen, Ejnar; and Svanborg, Lars, to Soerensen, Ejnar. Fish cleaning machine and method. 4,091,506, Cl. 17-52.000.
Soileau, Trasimond A., to General Electric Company. Discharge lamp operating circuit. 4,092,564, Cl. 315-208.000.
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Southwire Company: *See—*
Berry, Milton E., 4,091,860, Cl. 164-433.000.
Spaight, Ronald Neil, to International Business Machines Corporation. Heat transfer mechanism for integrated circuit package. 4,092,697, Cl. 361-386.000.
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Sperling, Gerhard; Jung, Dieter; Hachmann, Klaus; Schwuger, Milan Johann; and Smolka, Heinz, to Henkel Kommanditgesellschaft auf Aktien. Process for the production of powdery washing and cleansing agent compositions. 4,092,261, Cl. 252-131.000.
Sperry Rand Corporation: *See—*
Andrews, Thomas L., Jr.; and Mendenhall, Charles E., 4,092,682, Cl. 360-77.000.
Andrews, Thomas L., Jr.; and Mendenhall, Charles E., 4,092,683, Cl. 360-77.000.
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Spurk, Joseph H., to United States of America, Army. Recoilless rifle nozzle. 4,091,709, Cl. 89-1.703.
Staaf, Gustaf Adolf. Mixer with no moving parts. 4,092,013, Cl. 366-165.000.
Stach, Kurt, deceased: *See—*
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Stark, Ernest H., to Barber-Colman Company. Pneumatic pressure transmitter responsive to temperature and humidity. 4,091,992, Cl. 236-44.00C.
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Steinke, Thomas J. Self-regulating fluid control valve. 4,091,624, Cl. 61-25.000.
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Stelzer, Robert A.: *See—*
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Stetson, Earl W., to General Electric Company. Overvoltage surge arrester having laterally biased internal components. 4,092,694, Cl. 361-126.000.
Stevens, Violete L.; Sexton, Arthur R.; and Corson, Frederick P., to Dow Chemical Company, The. Process for making polyglycidyl esters. 4,092,339, Cl. 260-410.600.
Stevenson, James S., to Terminator Products, Inc. Safe tank filling apparatus. 4,091,849, Cl. 141-302.000.
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Stevenson, Paul D., to General Motors Corporation. Lock-up converter clutch with centrifugal control valves. 4,091,899, Cl. 192-3.300.
Stevenson, Wayne E., Jr., to Stevenson Machine Shop. Safety utility knife. 4,091,537, Cl. 30-286.000.
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Stewart, Peter Antony Eabry, to Rolls-Royce (1971) Limited. Diagnostic apparatus and method for gas turbine engines. 4,092,537, Cl. 250-314.000.
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Stigliani, Daniel J., Jr., to International Business Machines Corp. Side-coupling of light for an optical fiber. 4,092,061, Cl. 350-96.180.
Stingl, Hans Alfred, to Toms River Chemical Corporation. Process for dyeing nylon with lower alkyl ether-containing diazo dyes and product thereof. 4,092,103, Cl. 8-41.00B.
Stipanuk, Andrew D., to Porelon, Inc. Wear-activated ribbon reinker. 4,091,914, Cl. 400-196.100.
Stites, James J. Fireplace heat extractor. 4,091,794, Cl. 126-121.000.
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Stringfellow, Dale A., to Upjohn Company, The. Restoration of interferon response. 4,092,425, Cl. 424-305.000.
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Stucker, Harold Lloyd, to General Electric Company. Method of preparing and installing cobalt-rare earth permanent magnets. 4,092,184, Cl. 148-103.000.
Stut, Hans, to Siemens Aktiengesellschaft. Apparatus for floating melt zone processing of a semiconductor rod. 4,092,124, Cl. 23-273.00R.
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Suen, Tzeng Jiueq; and Begala, Arthur James, Jr., to American Cyanamid Company. Corrosion and scale inhibitors for industrial recirculating cooling water systems. 4,092,244, Cl. 210-58.000.
Sueoka, Tetsuro; and Ishibashi, Satoshi, to Kabushiki Kaisha Meidensha. Gate controlled semiconductor device. 4,092,703, Cl. 357-38.000.
Suermann, Robert E.; and Wall, Edwin G., to Triangle Pacific Corp. (TriPac). Method of assembling a cabinet frame and door to permit internally coating same. 4,091,522, Cl. 29-460.000.
Suga, Nagaichi. Corrosion testing machine. 4,092,122, Cl. 23-253.00C.
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Sullins, John K., to Canton Textile Mills, Inc. Method of recovering oxidized dye from dye wash water. 4,092,105, Cl. 8-81.000.
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Suovaniemi, Osmo; Virkola, Pertti; and Adlercreutz, Herman, to Osmo Antero Suovaniemi. Method and apparatus for establishing fecal occult blood. 4,092,120, Cl. 23-253.0TP.
Sutter, Hanspeter, to Luwa AG. Mounting apparatus for a textile machine, especially a card. 4,091,507, Cl. 19-107.000.
Suzuki, Akihiko; and Takematsu, Hikaru, to Iwasaki Tsushinki Kabushiki Kaisha. Key telephone system. 4,092,501, Cl. 179-99.000.
Suzuki, Chuji; Yasuda, Syoichi; and Nishioka, Yoshiki, to Sharp Kabushiki Kaisha. Pattern recognition systems. 4,092,631, Cl. 340-146.30J.
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Suzuki, Satoshi, 4,091,770, Cl. 123-242.000.
Suzuki, Jugoro: *See—*
Fukuda, Yoshio; Suzuki, Jugoro; Fukuma, Toshiaki; and Takada, Michinosuke, 4,092,069, Cl. 356-88.000.
Suzuki, Kenji: *See—*
Hori, Yutaka; Honda, Zenzo; Suzuki, Kenji; Nakamoto, Keiji; and Yamamoto, Yoshiharu, 4,092,452, Cl. 428-215.000.
Suzuki, Ryuji; Yamaguchi, Kimiaki; Nagamoto, Shunichi; Niwa, Takashi; and Matsushima, Haruo, to Matsushita Electric Industrial Co. Ltd. Turntable drive mechanism in electronic oven. 4,092,512, Cl. 219-10.55F.
Suzuki, Satoshi, to Suzuki Industry Co., Ltd. Rotary engine. 4,091,770, Cl. 123-242.000.
Suzuki, Yasuyuki: *See—*
Miura, Koji; Takeshima, Kenjun; Kodama, Takuya; Imamura, Masashi; Hongo, Kyoko; Takagawa, Noboru; Hamatani, Yukitaka; and Suzuki, Yasuyuki, 4,092,350, Cl. 260-521.00R.
Suzuki, Yoshio; Minai, Masayoshi; Hamma, Noritaka; Murayama, Eiichi; and Aono, Shunji, to Sumitomo Chemical Company, Limited. Diheterocyclic esters of 4-(1,1-bis-(phenoxy-propionic or -butoyric acid)-cyclohexane)α-methyl substituted. 4,092,324, Cl. 260-295.50R.
Svanborg, Lars: *See—*
Soerensen, Ejnar; and Svanborg, Lars, 4,091,506, Cl. 17-52.000.
Svenska Geotherm Aktiebolag: *See—*
Madsen, Henning Brinch, 4,091,994, Cl. 237-2.00B.
Swain, Stephen C., to March Enterprise. Skateboard having a flexible and resilient chassis with speed control means. 4,092,033, Cl. 280-87.04A.
Swanson, Harold V., to Interpace Corporation. Connector for use in a method for replacing an existing utility pole without disturbing hardware mounted thereon. 4,092,079, Cl. 403-306.000.
Swiss Aluminium Limited: *See—*
Yarwood, John C.; Dore, James E.; and Preuss, Robert K., 4,092,153, Cl. 75-68.00R.
SWS Silicones Corporation: *See—*
Piskoti, Charles, 4,092,279, Cl. 260-8.000.
Sycor, Inc.: *See—*
Butsch, Otto R., 4,092,687, Cl. 360-102.000.
Sze, Morgan C., to Lummus Company, The. Supported vanadia catalyst for nitrile production and process for preparing the catalyst. 4,092,271, Cl. 252-455.00R.
Tabler, Charles P., to Kornylak Corporation. Speed control attachment for gravity roller conveyor. 4,091,907, Cl. 193-35.00A.
Taiheiyo Engineering Inc.: *See—*
Takahashi, Ken; and Inoue, Hideo, 4,091,627, Cl. 61-45.00D.
Taisho Pharmaceutical Company Limited: *See—*
Yasumoto, Mitugi; Yamashita, Junichi; Yamawaki, Ichiro; Unemi, Norio; Kitazato, Kenji; Hashimoto, Sadao; and Fujii, Setsuro, 4,092,313, Cl. 544-313.000.
Takada, Michinosuke: *See—*
Fukuda, Yoshio; Suzuki, Jugoro; Fukuma, Toshiaki; and Takada, Michinosuke, 4,092,069, Cl. 356-88.000.
Takagawa, Noboru: *See—*
Miura, Koji; Takeshima, Kenjun; Kodama, Takuya; Imamura, Masashi; Hongo, Kyoko; Takagawa, Noboru; Hamatani, Yukitaka; and Suzuki, Yasuyuki, 4,092,350, Cl. 260-521.00R.
Takahashi, Ken; and Inoue, Hideo, to Taiheiyo Engineering Inc. Sys-

tem and equipment for operating self-advancing supports. 4,091,627, Cl. 61-45.00D.

Takahashi, Noriyuki: *See—*
Urushiyama, Goro; and Takahashi, Noriyuki, 4,092,017, Cl. 267-65.00B.

Takahashi, Ryohei; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; and Sakashita, Nobuyuki, to Ishihara Sangyo Kaisha, Ltd. Herbicidal compound, herbicidal composition containing the same and method of use thereof. 4,092,151, Cl. 71-94.000.

Takahatake, Yuriko: *See—*
Kondo, Kiyoshi; Matsui, Kiyohide; Negishi, Akira; and Takahatake, Yuriko, 4,092,482, Cl. 560-213.000.

Takaiwa, Masakazu: *See—*
Kobayashi, Akio; Yaguchi, Kunihide; and Takaiwa, Masakazu, 4,092,402, Cl. 423-243.000.

Takaku, Sakae: *See—*
Mori, Takashi; Takaku, Sakae; Oi, Nobuhiro; Shindo, Minoru; Hirano, Takeaki; Kataoka, Shigeyuki; and Furuno, Kouji, 4,092,431, Cl. 424-324.000.

Takamatsu, Akira: *See—*
Okamoto, Rokuro; Fukumoto, Tsumoru; Takamatsu, Akira; and Takeuchi, Tomio, 4,092,473, Cl. 536-17.000.

Takamori, Shigeru; Yamashita, Kazutaka; and Kono, Yoshinao, to Kao Soap Co., Ltd. Epoxy resin composition containing polycarboxylic acid compound. 4,092,295, Cl. 260-47.0EA.

Takeda Chemical Industries, Ltd.: *See—*
Furuoya, Itsuo; Kobayashi, Atsuo; and Ogino, Katsuhiko, 4,092,372, Cl. 260-681.000.

Takeda, Kunihiko: *See—*
Miyake, Tetsuya; Seko, Maomi; Takeda, Kunihiko; Ikeda, Akihiko; and Imamura, Kazuo, 4,092,398, Cl. 423-7.000.

Takei, Toshiyuki: *See—*
Nishioka, Yuji; Tokyama, Tetsuya; and Takei, Toshiyuki, 4,092,602, Cl. 325-346.000.

Takematsu, Hikaru: *See—*
Suzuki, Akihiko; and Takematsu, Hikaru, 4,092,501, Cl. 179-99.000.

Takeshima, Kenjun: *See—*
Miura, Koji; Takeshima, Kenjun; Kodama, Takuya; Imamura, Masashi; Hongo, Kyoko; Takagawa, Noboru; Hamatani, Yukitaka; and Suzuki, Yasuyuki, 4,092,350, Cl. 260-521.00R.

Takeuchi, Tomio: *See—*
Okamoto, Rokuro; Fukumoto, Tsumoru; Takamatsu, Akira; and Takeuchi, Tomio, 4,092,473, Cl. 536-17.000.

Tamura, Masayuki: *See—*
Hayashi, Yukichi; Tamura, Masayuki; Sugimoto, Osamu; Kobayashi, Shinichi; and Tanaka, Masanori, 4,091,908, Cl. 194-100.00A.

Tamura, Takashi; Matsuzaki, Tsuneo; Kasahara, Jyunkichi; and Nakamura, Ken, to Konishiroku Photo Industry Co. Ltd. Temperature sensor for use in a heated roll. 4,091,673, Cl. 73-351.000.

Tanaka, Masanori: *See—*
Hayashi, Yukichi; Tamura, Masayuki; Sugimoto, Osamu; Kobayashi, Shinichi; and Tanaka, Masanori, 4,091,908, Cl. 194-100.00A.

Tanemura, Mitsuru; Shinozaki, Teizo; Shindo, Minoru; Hata, Shun-ichi; Mizuno, Koji; Ono, Masayoshi; Wakabayashi, Kiyoshige; Nakano, Toshiaki; Nishii, Yasuho; Matsuno, Takashi; and Ohsugi, Yoshiyuki, to Chugai Seiyaku Kabushiki Kaisha. Novel aminobenzoic acid derivatives, process for preparing the same and pharmaceutical composition containing the same. 4,092,426, Cl. 424-309.000.

Tanner, Howard Carl: *See—*
Rosenbaum, Walter Steven; and Tanner, Howard Carl, 4,092,729, Cl. 364-900.000.

Tano, Eiichi: *See—*
Kawasaki, Masahiro; Tano, Eiichi; and Sawada, Yoshio, 4,092,653, Cl. 354-60.00L.

Tapp, David J.: *See—*
Schuessler, John C.; and Tapp, David J., 4,092,620, Cl. 335-128.000.

Tatina, Richard A., to Portec, Inc. Adjustable twist lock. 4,092,040, Cl. 296-35.00A.

Tattle-Tale, Inc.: *See—*
Newsom, C. Fred, 4,092,625, Cl. 337-405.000.

Taurus Gumiipari Vallalat: *See—*
Mikes, Sandor; Timar, Matyas; and Bartha, Zoltan, 4,091,843, Cl. 138-127.000.

Tauscher, Manfred: *See—*
Credner, Karl; Goring, Joachim; Brenner, Gunter; and Tauscher, Manfred, 4,092,417, Cl. 424-253.000.

Tava, Paul; and Herrick, Steven S. Conversion calculator. 4,092,523, Cl. 235-310.000.

Technical Development Company: *See—*
Zemke, Julius, 4,091,958, Cl. 220-291.000.

Teders, Philip J.: *See—*
Amrine, Bruce A.; and Teders, Philip J., 4,091,672, Cl. 73-343.00R.

Teijeiro, Joseph M., to JTX Systems, Inc. Shrimp product and process. 4,092,435, Cl. 426-296.000.

Tejfalussy, Andras: *See—*
Horvath, Istvan; Korospataky, Sandor; Rajki, Sandor; Tejfalussy, Andras; and Tischner, Tibor, 4,091,566, Cl. 47-17.000.

Tektronix, Inc.: *See—*
Rhodes, Charles Wesley; and Crosby, Philip Stephen, 4,092,666, Cl. 358-10.000.
Rhodes, Charles Wesley; and Jurgensen, David James, 4,092,674, Cl. 358-186.000.

Telecommunications Radioelectriques et Telephoniques T.R.T.: *See—*
Guidoux, Loic Bernard Yves, 4,092,618, Cl. 333-70.00T.

Telefonaktiebolaget L M Ericsson: *See—*
Lofmark, Bengt Gustav, 4,092,499, Cl. 179-84.0VF.

Telsco Industries, Inc.: *See—*
Ridgway, H. Curtis, 4,091,997, Cl. 239-206.000.

Terakado, Katsumi: *See—*
Yamanaka, Akira; Terakado, Katsumi; and Nagaike, Naofumi, 4,091,888, Cl. 180-82.00R.

Terekhin, Vladimir Afanasievich: *See—*
Kostousov, Anatoly Ivanovich; Ionov, Valentin Vasilievich; Shakhbazyan, Vyacheslav Georgievich; and Terekhin, Vladimir Afanasievich, 4,091,714, Cl. 90-76.000.

Terminator Products, Inc.: *See—*
Stevenson, James S., 4,091,849, Cl. 141-302.000.

Terry, Ruel Carlton, to In Situ Technology, Inc. Converting underground coal fires into commercial products. 4,092,052, Cl. 299-2.000.

Tesoro, Giuliana C.: *See—*
Valko, Emery I., deceased; Tesoro, Giuliana C.; and Olds, Walter F., 4,092,108, Cl. 8-116.00P.

Texaco Development Corporation: *See—*
Nieh, Edward C. Y., 4,092,316, Cl. 544-351.000.

Texaco Inc.: *See—*
Duranleau, Roger G., 4,092,327, Cl. 260-307.0DA.
Langford, Obie M.; and Peelman, Harold E., 4,092,545, Cl. 250-501.000.
Mead, Theodore C.; Sequeira, Avilino, Jr.; and Odell, Norman R., 4,092,240, Cl. 208-301.000.
Smith, Michael P., 4,092,536, Cl. 250-265.000.

Texas Instruments Incorporated: *See—*
Blocker, Truman G., III, 4,092,660, Cl. 357-22.000.
Burkett, Bobby G.; and Henry, Raymond W., 4,092,730, Cl. 364-900.000.
Collins, Dean R.; and Norvell, Bill R., 4,092,734, Cl. 365-238.000.
D'Entremont, John R., 4,092,573, Cl. 318-221.00C.
Lee, Gene DuPree, 4,091,909, Cl. 400-124.000.
Luecke, Gerald, 4,092,527, Cl. 364-709.000.
McElroy, David J., 4,092,735, Cl. 365-183.000.
Padovani, Francois A.; Miller, Michael Brant; Moore, James A.; Fowler, James H.; June, Malcolm Neville; Matthews, James D.; Morton, T. R.; Stotko, Norbert A.; and Palmer, Lewis B., 4,092,446, Cl. 427-213.000.
Shepherd, Mark, Jr., 4,092,636, Cl. 340-274.00R.
Voigt, William C.; and Jergens, William F., 4,092,709, Cl. 363-18.000.

Textron Inc.: *See—*
MacFee, Norman W., 4,091,509, Cl. 24-205.11R.
MacFee, Norman W., 4,091,532, Cl. 29-770.000.
Myers, John L., 4,092,486, Cl. 174-48.000.
Ripley, Richard Edward, 4,092,638, Cl. 340-336.000.

Thaler, Sherwood Sheldon, to American Optical Corporation. P-Wave control, R-wave inhibited ventricular stimulation device. 4,091,817, Cl. 128-419.0PG.

Thalmann, Armin; and Zeller, Josef, to Concast AG. Apparatus for exchanging pouring tubes at casting vessels of continuous casting installations. 4,091,861, Cl. 164-437.000.

Theodore, Ares N.: *See—*
Siwiec, Elaine C.; Van Oene, Henk; and Theodore, Ares N., 4,092,373, Cl. 260-830.00R.

Therm-O-Disc Incorporated: *See—*
Snider, Harold F., 4,091,763, Cl. 116-114.500.

Thermo Electron Corporation: *See—*
Lazaridis, Lazaros J.; Searight, Edward F.; and Shefsiek, Paul K., 4,091,801, Cl. 126-378.000.

Theurer, Josef; and Riesaberger, Klaus, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft M.B.H. Resilient single axle truck. 4,091,739, Cl. 105-224.00R.

Theysohn, Rainer; Wurmb, Rolf; Seydl, Wolfgang; and Zahradnik, Franz, to BASF Aktiengesellschaft. Flameproof nylon molding compositions. 4,092,284, Cl. 260-28.00R.

Thiel, Max: *See—*
Winter, Werner; Thiel, Max; Stach, Kurt, deceased; Roesch, Androniki; Plattner, Werner, administrator; and Schaumann, Wolfgang, 4,092,416, Cl. 424-250.000.

Thiesler, Ingo; Weiner, Max; and Steffens, Karl, to Polysius AG. Grate plate arrangement for a travelling grate. 4,091,750, Cl. 110-329.000.

Thomas, Robert D., to Smith International, Inc. Rotary air percussion bit. 4,091,884, Cl. 175-410.000.

Thompson, Alistair Nigel. Trench shoring machines. 4,091,626, Cl. 61-41.00A.

Thomson-CSF: *See—*
Bouboulein, Albert, 4,092,613, Cl. 330-289.000.
Deman, Pierre; and Lechevin, Rene, 4,092,598, Cl. 325-55.000.
Desormiere, Bernard; and Berte, Marc, 4,092,588, Cl. 324-56.000.
Hawkes, Thaddeus; and Reymond, Jean-Claude, 4,092,059, Cl. 350-96.160.
Micheron, Francois, 4,092,494, Cl. 179-1.00F.
Picquendar, Jean-Edgar; and Sokoloff, Boris, 4,092,723, Cl. 364-726.000.

Thomson, Ronald E.; and Schmitt, James F., to Madison-Kipp Corporation. Cleaning device for conveyor system rail. 4,091,492, Cl. 15-246.000.

Thornhill, Dewey B., to Boise Cascade Corporation. Method and apparatus for forming composite container including a tab-cut label layer. 4,091,718, Cl. 93-39.10R.

Thurber, T. Craig: *See—*
Townsend, Leroy B.; and Thurber, T. Craig, 4,092,305, Cl. 260-140.000.

Timar, Matyas: *See—*
Mikes, Sandor; Timar, Matyas; and Bartha, Zoltan, 4,091,843, Cl. 138-127.000.

Timex Corporation: *See—*
Oates, William Lee, 4,091,580, Cl. 51-283.00R.

Tinnes, Bernhard; and Mantey, Paul-Gerhard, to Metacon A.G. Molten metal nozzle having capillary gas feed. 4,091,971, Cl. 222-603.000.

Tischner, Tibor: *See—*
Horvath, Istvan; Korospataky, Sandor; Rajki, Sandor; Tejfalussy, Andras; and Tischner, Tibor, 4,091,566, Cl. 47-17.000.

Titan Contractors Corporation: *See—*
Cherrington, Martin Dee, 4,091,631, Cl. 61-72.700.

Titus, Leo E.: *See—*
United States of America, National Aeronautics and Space Administration; and Titus, Leo E., 4,092,617, Cl. 333-17.00R.

Togo, Takashi, to Mochida Pharmaceutical Co., Ltd. Laser optical apparatus for operation under a microscope. 4,091,814, Cl. 128-303.100.

Tokyama, Tetsuya: *See—*
Nishioka, Yuji; Tokyama, Tetsuya; and Takei, Toshiyuki, 4,092,602, Cl. 325-346.000.

Tokyo Denpa Company Ltd.: *See—*
Furusawa, Kaoru; and Ishigami, Sumiyuki, 4,091,679, Cl. 73-497.000.

Tomoyoshi, Uchiya, to Uchiya Co., Ltd. Thermostat assembly. 4,092,624, Cl. 337-340.000.

Toms River Chemical Corporation: *See—*
Stingl, Hans Alfred, 4,092,103, Cl. 8-41.00B.

Tonner, George F., to Carnation Company. Non-dairy coffee whitener containing acetate salt. 4,092,438, Cl. 426-601.000.

Tooheys Limited: *See—*
Sanderson, Gordon Francis; and Burge, Anthony George, 4,091,597, Cl. 53-59.00R.

Torenbeek, Reinder: *See—*
Oosterwijk, Hendrik Harm Jannes; and Torenbeek, Reinder, 4,092,470, Cl. 526-227.000.

Toshiba Kikai Kabushiki Kaisha: *See—*
Komiyama, Yoshizo; Nakamura, Hiromi; and Abe, Hiroaki, 4,091,970, Cl. 222-596.000.

Tossey, De Fro. Sludge distribution network. 4,092,338, Cl. 210-142.000.

Towmotor Corporation: *See—*
Brown, Vaikai K.; and Fatur, Richard N., 4,091,889, Cl. 180-101.000.

Townsend, Leroy B.; and Thurber, T. Craig. Alkyl triazeno uracil compounds and method of preparation thereof. 4,092,305, Cl. 260-140.000.

Townsend, Leroy B.; Wise, Dean Sylvester; and Earl, Robert Arthur, to University of Utah. 2,4-Dichloro-5-(β-D-ribofuranosyl) pyrimidines and substituted derivatives. 4,092,472, Cl. 536-1.000.

Toyama Chemical Company Limited: *See—*
Miura, Koji; Takeshima, Kenjun; Kodama, Takuya; Imamura, Masashi; Hongo, Kyoko; Takagawa, Noboru; Hamatani, Yukitaka; and Suzuki, Yasuyuki, 4,092,350, Cl. 260-521.00R.

Toyo Seikan Kaisha Ltd.: *See—*
Sakurai, Eishiro, 4,092,389, Cl. 264-89.000.

Toyoda Machine Works, Ltd.: *See—*
Nakaso, Tohru; Hosokawa, Manabu; Nomura, Kenzi; and Hikosaka, Tatsuya, 4,091,526, Cl. 29-568.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Mituyasu, Masaki; and Masui, Takatoshi, 4,091,781, Cl. 123-119.0EC.
Nomura, Takao; Umemoto, Yoshiro; and Sakamoto, Tatsuo, 4,092,200, Cl. 156-245.000.
Okabayashi, Keiichi, 4,091,778, Cl. 123-117.00A.
Yamada, Makoto; and Kinaga, Eiichi, 4,091,508, Cl. 24-171.000.

Trans-America Power Equipment, Inc.: *See—*
Ober, Howard R., 4,091,851, Cl. 144-193.00R.

Trans Canada Pipelines Limited: *See—*
Potter, David Walter, 4,091,678, Cl. 73-432.00R.

Trecan Ltd.: *See—*
Chase, Charles Edgar, 4,091,747, Cl. 110-210.000.

Trescher, Viktor: *See—*
Bocker, Ernst; Kracht, Wolfgang; Rupp, Roland; Schellmann, Erhard; Trescher, Viktor; and Ullrich, Martin, 4,092,089, Cl. 425-10.000.

Treuner, Uwe D.: *See—*
Breuer, Hermann; and Treuner, Uwe D., 4,092,475, Cl. 544-21.000.

Treves, Gino R., to FMC Corporation. Herbicidal 5-pyrimidinecarbonitriles. 4,092,150, Cl. 71-92.000.

Trezise, Richard D.: *See—*
Ku, Joseph P.; Matin, Fereidoon; and Trezise, Richard D., 4,091,913, Cl. 400-124.000.

Triangle Pacific Corp. (TriPac): *See—*
Suermann, Robert E.; and Wall, Edwin G., 4,091,522, Cl. 29-460.000.

Trifonov, Todor Kostadinov: *See—*
Balevski, Angel Tonchev; Nikolov, Ivan Dimov; Mateev, Evgeni Hristov; Trifonov, Todor Kostadinov; and Kojuharov, Vassil Vladimirov, 4,092,385, Cl. 264-45.500.

Trolle, Sten, to AB Carbox. Device for handling large workpieces. 4,091,938, Cl. 214-1.00F.

Trott, Arthur F.: *See—*
Troutner, Vernon H.; Foltz, Carl L.; and Trott, Arthur F., 4,091,880, Cl. 173-163.000.

Trott, Gary: *See—*
Handy, Richard L.; Ferguson, Eldon Glen; Barksdale, Richard D.; Fox, Nathaniel S.; and Trott, Gary, 4,091,661, Cl. 73-88.00E.

Troutner, Vernon H.; Foltz, Carl L.; and Trott, Arthur F., to Concept Inc. Surgical wire inserter apparatus. 4,091,880, Cl. 173-163.000.

Trutmann, Willy: *See—*
Bombelli, Nino; and Trutmann, Willy, 4,092,046, Cl. 302-49.000.

TRW Inc.: *See—*
van Buren, Harold S., Jr., 4,091,962, Cl. 220-326.000.

Tsang, Peter Hing-Shya; Hradek, Richard W.; and Bode, James Daniel, to Bendix Corporation, The. Barium oxide coated zirconia particle for use in an oxygen extractor. 4,092,264, Cl. 252-186.000.

Tsuchiya, Hiroyuki: *See—*
Kamiya, Kunio; Yusa, Hideo; and Tsuchiya, Hiroyuki, 4,092,133, Cl. 55-62.000.

Tsuchiya, Takao: *See—*
Akazawa, Susumu; Tsuchiya, Takao; Murakami, Kyoichi; and Okada, Takashi, 4,092,667, Cl. 358-26.000.

Tsuda, Hiroshi; Nishikawa, Masaji; Kimura, Katsuhiko; and Sato, Eiichi, to Olympus Optical Company Limited. Screen drum type electrographic apparatus having a correcting lens to produce an image of equal length and aspect relative to the original. 4,092,065, Cl. 355-8.000.

Tsuji, Kozo: *See—*
Domoto, Masahiro; and Tsuji, Kozo, 4,092,454, Cl. 428-288.000.

Tsuji, Yoshio: *See—*
Hasegawa, Takanori; and Tsuji, Yoshio, 4,091,727, Cl. 101-128.200.

Tsujii, Yasuhiro: *See—*
Takahashi, Ryohei; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; and Sakashita, Nobuyuki, 4,092,151, Cl. 71-94.000.

Tsukada, Yuichi: *See—*
Izawa, Tetsuo; Kajikawa, Shuji; Satomi, Koji; Nakano, Koichiro; Kurosawa, Shinichi; Hirai, Keitaro; and Tsukada, Yuichi, 4,091,545, Cl. 34-9.000.

Tsukamoto, Kotaro. Edulcoration equipment for wire coils. 4,091,827, Cl. 134-149.000.

Tsurumi, Yoshihiro; and Fujioka, Tomio, to Mitsubishi Gas Chemical Co., Inc. Process for manufacture of L(+)-tartaric acid or salts thereof. 4,092,220, Cl. 195-30.000.

Tsuzuki, Naobumi; Koji, Tetsu; and Noguchi, Kazuo, to Nippon Electric Co., Ltd. Process for forming porous semiconductor region using electrolyte without electrical source. 4,092,445, Cl. 427-85.000.

Tucker, Frederick Robert: *See—*
Daher, Reinhard L.; and Tucker, Frederick Robert, 4,091,472, Cl. 3-7.000.

Tucoulat, Daniel: *See—*
Chaze, Gilbert; Cherel, Guy; Guilloteau, Rene; and Tucoulat, Daniel, 4,091,699, Cl. 83-56.000.

Turk, Leonard G.: *See—*
Yuhas, Gerald Joseph; and Turk, Leonard G., 4,092,090, Cl. 425-28.00P.

Turkovich, Antone J.: *See—*
Button, Robert L., deceased; and Turkovich, Antone J., 4,091,931, Cl. 209-73.000.

Turner, Leonard M., Jr.: *See—*
Anthony, David S.; and Turner, Leonard M., Jr., 4,092,087, Cl. 417-131.000.

Tyers, G. Frank O.: *See—*
Brownlee, Robert R.; and Tyers, G. Frank O., 4,091,818, Cl. 128-419.0PG.

Uchiya Co., Ltd.: *See—*
Tomoyoshi, Uchiya, 4,092,624, Cl. 337-340.000.

Uebayashi, Mustuo: *See—*
Namikawa, Kosuke; Onoda, Hajime; Okamoto, Mineo; Fujii, Isamu; Matsuda, Takaaki; Uebayashi, Mustuo; and Suzuki, Hirosi, 4,091,668, Cl. 73-263.000.

Ueno, Masayasu: *See—*
Sakuma, Isamu; Yonezu, Hiroo; Nishida, Katsuhiko; Kamejima, Taibun; Yuasa, Tonao; Ueno, Masayasu; Uji, Toshio; Nannichi, Yasuo; and Hayashi, Izuo, 4,092,614, Cl. 331-94.50P.

Uher, Joseph F., to SCM Corporation. Flux for metal casting. 4,092,159, Cl. 75-257.000.

Uji, Toshio: *See—*
Sakuma, Isamu; Yonezu, Hiroo; Nishida, Katsuhiko; Kamejima, Taibun; Yuasa, Tonao; Ueno, Masayasu; Uji, Toshio; Nannichi, Yasuo; and Hayashi, Izuo, 4,092,614, Cl. 331-94.50P.

Ullrich, John P.: *See—*
Martwick, Wilford E.; Ullrich, John P.; and Kraemer, Arnum E., 4,091,735, Cl. 102-79.000.

Ullrich, Martin: *See—*
Bocker, Ernst; Kracht, Wolfgang; Rupp, Roland; Schellmann, Erhard; Trescher, Viktor; and Ullrich, Martin, 4,092,089, Cl. 425-10.000.

Ullrich, Osmar A.: *See—*
Andrus, Paul G.; Ullrich, Osmar A.; and Hardenbrook, James M., 4,092,165, Cl. 96-38.200.

Ulrich, Henri: *See—*
Frulla, Floro F.; Sayigh, Adnan A. R.; Ulrich, Henri; and Whitman, Peter J., 4,092,343, Cl. 260-453.0AM.

Ultra Centrifuge Nederland N.V.: *See—*
Clazing, Cornelis Petrus Maria, 4,091,836, Cl. 137-259.000.

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Underwood, James L., to Pioneer Heddle and Reed Company Incorporated. Loom harness. 4,091,844, Cl. 139-91.000.
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Welschof, Hans-Heinrich, 4,091,641, Cl. 64-21.000.
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Larrabee, Edward Whittum, 4,092,546, Cl. 250-515.000.
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Fischer, Paul W.; and Pye, David S., 4,092,252, Cl. 252-8.50A.
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von Hagen, Wolf-Rudiger, 4,091,756, Cl. 112-287.000.
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Jennison, William, 4,091,675, Cl. 73-422.00R.
Woodacre, Albert, 4,092,517, Cl. 219-137.0PS.
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Snyder, David E.; Locke, Joe B.; and Brabits, William C., 4,091,832, Cl. 137-72.000.
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Agriculture: *See*—
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Hordvik, Audun, 4,091,681, Cl. 73-574.000.
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Ryan, Carl R., 4,092,606, Cl. 329-124.000.
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Brice, John Chadwick; and Robertson, John Mackay, 4,092,208, Cl. 156-624.000.
Camerik, Eduard, 4,092,671, Cl. 358-128.000.
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Hinz, Hans-Dieter, 4,092,650, Cl. 346-155.000.
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Joslin, Frederick R.; Palma, Gary E.; and Whitney, Gary L., 4,092,515, Cl. 219-121.0LM.
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Halpern, Gerald M.; and Kim, Hyogun, 4,092,381, Cl. 264-15.000.
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Townsend, Leroy B.; Wise, Dean Sylvester; and Earl, Robert Arthur, 4,092,472, Cl. 536-1.000.
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Muhle, Dietrich, 4,092,118, Cl. 23-252.00R.
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Bennett, Robert Gordon, Jr.; and Bonnanzio, Richard Louis, 4,092,048, Cl. 308-9.000.
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Van Peppen, Jan F.; and Fisher, William Bernard, to Allied Chemical Corporation. Production of cyclohexanone. 4,092,360, Cl. 260-586.00P.
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Vogel, Kenneth E.; and Peterson, Dean R., to McQuay-Perfex, Inc. Electric defrost heater for fin and tube refrigeration heat exchanger. 4,091,637, Cl. 62-276.000.
Voigt, William C.; and Jergens, William F., to Texas Instruments Incorporated. Multiple output self oscillating converter regulator power supply. 4,092,709, Cl. 363-18.000.
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Grubb, Daniel Baker; Schumacher, William Ludlow; and Volinskie, Robert, 4,091,531, Cl. 29-749.000.
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von Seggern, Ernest Alfred: *See—*
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von Starck, Axel; and Gerbig, Hans-Erwin, to AEG-Elotherm, G.m.b.H. Electromagnetic conveyer trough for the conveyance of molten metals. 4,092,086, Cl. 417-50.000.
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Vreugdenhil, Arie D., to Shell Oil Company. Preparation of a non-linear elastomeric copolymer. 4,092,375, Cl. 260-876.00B.
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Sibilia, John P.; and Vrooman, Bernard Harlow, 4,091,855, Cl. 152-359.000.
Vulcano, Vincent N.; and Friedman, Maurice W., to Friedman, Maurice W. Semi-automatic bagging machine. 4,091,598, Cl. 53-241.000.
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Webbon, Bruce W.; and Vykukal, Hubert C., 4,091,465, Cl. 2-2.10A.
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Rigstad, Dennis A., 4,092,386, Cl. 264-46.500.
Rosenberg, Arnold Morry; and Gaidis, James Michael, 4,092,109, Cl. 21-2.50R.
Wade, Lisby Lucius; and McDermott, Muriel, to Dow Chemical Company, The. Method of controlling manure-breeding insects. 4,092,421, Cl. 424-266.000.
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Tanemura, Mitsuru; Shinozaki, Teizo; Shindo, Minoru; Hata, Shunichi; Mizuno, Koji; Ono, Masayoshi; Wakabayashi, Kiyoshige; Nakano, Toshiaki; Nishii, Yasuho; Matsuno, Takashi; and Ohsugi, Yoshiyuki, 4,092,426, Cl. 424-309.000.
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Walker, Howard R., to Joseph E. Podgor, Inc. Magnetic registration apparatus for silk screen printer. 4,091,726, Cl. 101-38.00A.
Wall, Edwin G.: *See—*
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Wallace, Paul F., to Aluminum Company of America. Aluminum container having interior surface treated to suppress foaming and method therefor. 4,091,954, Cl. 220-470.000.
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Walton, Tommy L., to Burroughs Corporation. Flexible circuit assembly. 4,092,057, Cl. 339-17.00F.
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Wanser, Gerhard A. H., to Gould, Inc. Gas insulated electrical high or very high voltage cable. 4,092,485, Cl. 174-28.000.
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Mich, Thomas Frederick, 4,092,309, Cl. 260-239.100.
Sircar, Jagadish C.; Kesten, Stephen J.; and Zinnes, Harold, 4,092,325, Cl. 260-307.00H.

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Watanabe, Tokuji, to Hayashi Cutlery Company, Limited. Scissors. 4,091,539, Cl. 30-341.000.
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Weatherby, Robert G.; and Costello, Anthony C., to Kent Corporation. Strip accumulator. 4,092,007, Cl. 242-55.000.
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Cone, Clendon W., 4,091,987, Cl. 229-69.000.
Webb, Paul U.: *See*—
Hofferber, James A.; and Webb, Paul U., 4,092,722, Cl. 364-500.000.
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Berkoff, Charles E.; and Webb, Robert Lee, 4,092,352, Cl. 260-521.00H.
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Weber-Knapp Company: *See*—
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Weber, Robert W., to Servco Company, a division of Smith International, The. Underreaming tool with overriding extended arm retainer. 4,091,883, Cl. 175-287.000.
Weigl, James: *See*—
Clawson, Burrell E.; and Weigl, James, 4,091,917, Cl. 206-5.100.
Weikel, James August: *See*—
MacDonald, Dennis L.; and Weikel, James August, 4,092,436, Cl. 426-478.000.
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Thiesler, Ingo; Weiner, Max; and Steffens, Karl, 4,091,750, Cl. 110-329.000.
Weir, Donald Adams; and Usher, Eric Stanley, to International Standard Electric Corporation. Data transmission system for transmitting primary and secondary intelligence. 4,092,595, Cl. 325-38.00A.
Weiss, Nathan. Paint roller shield. 4,091,493, Cl. 15-248.00A.
Weisshaar, Manfred E. Menstrual calculator. 4,092,521, Cl. 235-88.0RC.
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Welcher, Richard P.; Rabinowitz, Robert; and Cibulskas, Algird S., to American Cyanamid Company. Controlled polymerization of dimethyldiallylammonium halides by the use of alkali metal or ammonium bisulfites or metabisulfites. 4,092,467, Cl. 526-80.000.
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Wendt, Hans J. Computerized dispatching system. 4,092,718, Cl. 364-436.000.
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Wesley, James G., to Labelette Company. Apparatus for labeling yarn skeins. 4,092,204, Cl. 156-481.000.
Western Electric Co., Inc.: *See*—
Zaleckas, Vincent Joseph, 4,091,529, Cl. 29-628.000.
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Western Geophysical Co. of America: *See*—
Hall, Ernest M., Jr., 4,092,628, Cl. 340-10.000.
Siems, Lee E.; Morgan, Paul M.; and Savit, Carl H., 4,092,629, Cl. 340-15.5TS.
Wheable, Desmond: *See*—
Fehr, Ivor John Martin; and Wheable, Desmond, 4,091,669, Cl. 73-299.000.
Wheeler, Richard George, to Breville Holdings Pty. Ltd. Sandwich toasting apparatus. 4,091,720, Cl. 99-375.000.
Whitaker, Charles M.: *See*—
Greenawalt, Eddie L.; and Whitaker, Charles M., 4,091,842, Cl. 138-90.000.
White, Allen Andrew; Yatcilla, George; and Fleming, Garold Lee, to Hesston Corporation. Slackening mechanism for bale tier. 4,091,724, Cl. 100-21.000.
White, Benjamin J.; Moreau, George; and Dworkin, Robert E., to Raytheon Company. Modulated carrier amplifying system. 4,092,610, Cl. 330-207.00A.
Whitman, Peter J.: *See*—
Frulla, Floro F.; Sayigh, Adnan A. R.; Ulrich, Henri; and Whitman, Peter J., 4,092,343, Cl. 260-453.0AM.
Whitney, Gary L.: *See*—
Joslin, Frederick R.; Palma, Gary E.; and Whitney, Gary L., 4,092,515, Cl. 219-121.0LM.
Whittingham, Reginald P., to Walter Kidde & Company, Inc. Crane with a pivotal assembly for detachably connecting and supporting a boom thereon. 4,091,935, Cl. 212-144.000.
Widdershoven, Louis Hubertus, to Raypak Produkten B.V. Gas-fired boiler. 4,091,768, Cl. 122-367.00C.
Widemann, Rudolf; and Ehrgott, Roland, to Siemens Aktiengesellschaft. Coil body. 4,092,622, Cl. 336-192.000.
Wieland, Dieter; and Schurr, Volker, to Andreas Stihl, Firma. Chain saw braking mechanism. 4,091,896, Cl. 188-166.000.
Wieland, Roman G. Limb support apparatus. 4,092,043, Cl. 297-429.000.
Wijnant, Petrus Leo Clemens; and Ijlstra, Hendrik Jan, to Stichting Reactor Centrum Nederland. Process for making a gastight passage. 4,091,520, Cl. 29-434.000.
Wikdahl, Nils A. L. Process for the separation of gas mixtures into component fractions according to their molecular or atomic weight. 4,092,130, Cl. 55-15.000.
Wilcox, Clinton H., to Alumax, Inc. Apparatus for shaping metal sheets. 4,091,652, Cl. 72-312.000.
Wilhere, Charles V.: *See*—
Easter, William M.; Wilhere, Charles V.; and Walker, George M., 4,091,969, Cl. 222-309.000.
Wilkinson, Stanley B., to General Electric Company. Protective relay circuit providing a combined distance and overcurrent function. 4,092,690, Cl. 361-80.000.
Willard, John Wesley, Sr., to Caw Industries, Inc. Method of prolonging the life or beauty of cut flowers. 4,092,145, Cl. 71-68.000.
William Zinnsser & Co., Inc.: *See*—
Martin, James W., 4,092,175, Cl. 134-42.000.
Williams, Anthony, to General Electric Company Limited, The. Protective relay arrangements. 4,092,691, Cl. 361-80.000.
Williams, David John: *See*—
Plant, David William; and Williams, David John, 4,092,478, Cl. 544-76.000.
Williams, David Lynn: *See*—
Ihrig, Arthur Morton; and Williams, David Lynn, 4,091,822, Cl. 131-9.000.
Williams, Delbert A.: *See*—
Ungar, Israel S.; Scher, Herbert I.; and Williams, Delbert A., 4,092,199, Cl. 156-222.000.
Williams, Elmer A.: *See*—
Clemens, James D.; and Williams, Elmer A., 4,091,776, Cl. 123-90.150.
Williams, Frank J., III, to General Electric Company. Polythioethermides. 4,092,297, Cl. 260-47.0CP.
Williams, Guy H.: *See*—
Henderson, Gary A.; and Williams, Guy H., 4,092,695, Cl. 361-232.000.
Williams, Millard M.; and Stelzer, Robert A., to Avco Corporation. Crop harvesting machine with flexible cutter bar. 4,091,602, Cl. 56-14.400.
Willmann, Karl: *See*—
Saufferer, Helmut; and Willmann, Karl, 4,091,779, Cl. 123-119.00E.
Wilmeth, Claude H.; and Morton, Fred H., to N-S-W Corporation. Very high torque ratchet wrench. 4,091,890, Cl. 81-57.390.
Wilson, Francis B.: *See*—
Edmunds, Robert H.; Huebner, John R.; Skurka, James A.; and Wilson, Francis B., 4,091,837, Cl. 137-341.000.
Wiltshire Cutlery Company Proprietary Ltd.: *See*—
Bayly, Peter Kingsley, 4,091,691, Cl. 76-86.000.
Winchell, David A.: *See*—
Fowles, Thomas A.; and Winchell, David A., 4,091,949, Cl. 215-251.000.
Winter, Werner; Thiel, Max; Stach, Kurt, deceased; Roesch, Androniki; by Plattner, Werner, administrator; and Schaumann, Wolfgang, to Boehringer Mannheim GmbH. Benzopyrone derivatives exhibiting anti-allergic activity. 4,092,416, Cl. 424-250.000.
Winters, Luther R., Jr.: *See*—
Lowthorp, Ernest C., deceased; Arnold, Frances T.; Winters, Luther R., Jr.; and Lippert, Roy, 4,091,765, Cl. 118-658.000.
Wise, Dean Sylvester: *See*—
Townsend, Leroy B.; Wise, Dean Sylvester; and Earl, Robert Arthur, 4,092,472, Cl. 536-1.000.
Wise, William L., to Coherent, Inc. Feedback loop control system employing method and apparatus for stabilizing total loop gain and bandwidth. 4,092,530, Cl. 250-205.000.
Withycombe, Donald Arthur: *See*—
Mookherjee, Braja Dulal; Withycombe, Donald Arthur; Katz, Ira; Goossens, Alfred E.; Vock, Manfred Hugo; Evers, William John; Vinals, Joaquin F.; and Kiwala, Jacob, 4,092,334, Cl. 260-347.200.
Wittenstein, Horst: *See*—
Peddinghaus, Gunther; Neumann, Harry; and Wittenstein, Horst, 4,092,091, Cl. 425-62.000.
Wittke, Ernest Carl, to Singer Company, The. Video processor for solid state star tracker. 4,092,670, Cl. 358-125.000.
Wohr, Rolf; and Gulich, Gerhard, to Robert Bosch GmbH. Method for electrostatic coating of articles under electric field strength limitation. 4,092,440, Cl. 427-33.000.
Wojciechowska, Hanna: *See*—
Gruszecki, Wojciech; Bordwski, Edward; Gumieniak, Jerzy; Gumieniak, Malgorzata; Smulkowski, Maciej; Wojciechowska, Hanna; and Bobrowski, Miroslaw, 4,092,335, Cl. 260-348.440.
Wolf, Wilhelm, to Bayer Aktiengesellschaft. Process for the purification of benzoic acid. 4,092,353, Cl. 260-525.000.
Wolford, Lionel T.; Lee, Chien Yung; and Dotson, Anderson O., Jr., to

Cities Service Company. (Cyclo)alkylenediammonium-bis-tetrahalophthalates. 4,092,345, Cl. 260-501.160.
Wolk, Hermann, to Siemens Aktiengesellschaft. Circuit board testing machine. 4,092,593, Cl. 324-158.00F.
Woltermann, Jay R.: *See*—
Braus, Harry; and Woltermann, Jay R., 4,092,292, Cl. 260-45.75B.
Wommelsdorf, Fritz, to Maschinenfabrik Rissen GmbH. Process and apparatus for coating an air-permeable container with a foil of thermoplastic material. 4,092,201, Cl. 156-285.000.
Wong, Dickson Tak Sun; and Liu, Quen Ling. Skirt and methods of making the same. 4,091,468, Cl. 2-212.000.
Wong, Shing Kuel. Apparatus for portioning extrudable food. 4,091,504, Cl. 17-32.000.
Wood, Donald C.: *See*—
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Wood, Linda S. Windsor, administratrix: *See*—
Arth, Glen E.; and Wood, Sumner, Jr., deceased, 4,092,413, Cl. 424-241.000.
Wood, Sumner, Jr., deceased: *See*—
Arth, Glen E.; and Wood, Sumner, Jr., deceased, 4,092,413, Cl. 424-241.000.
Woodacre, Albert, to United Kingdom Atomic Energy Authority. Electric arc welding processes and apparatus therefor. 4,092,517, Cl. 219-137.0PS.
Woods, Walter David. Electronic circuitry. 4,092,608, Cl. 330-10.000.
Wramba, Herbert: *See*—
Bergk, Berndt; Lilienbeck, Klemens; Ottmann, Gerhard Friedrich; Stolzenbach, Heinrich; Wramba, Herbert; and Wulff, Walter, 4,092,202, Cl. 156-331.000.
Wright, Hal Eldon; and Berwick, Martin Alfred, to Eastman Kodak Company. Nitrogen containing polymers aelements. 4,092,162, Cl. 96-1.50N.
Wright, Thomas H.: *See*—
Fox, Gaston M.; and Wright, Thomas H., 4,091,503, Cl. 17-11.000.
Wrulich, Herwig; and Schetina, Otto, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Bit holder. 4,091,692, Cl. 76-101.00R.
Wuerflein, James G.; and Spence, Charles R., to Warner & Swasey Company, The. Apparatus for extending a boom assembly. 4,091,936, Cl. 212-144.000.
Wulff, Walter: *See*—
Bergk, Berndt; Lilienbeck, Klemens; Ottmann, Gerhard Friedrich; Stolzenbach, Heinrich; Wramba, Herbert; and Wulff, Walter, 4,092,202, Cl. 156-331.000.
Wulfing, Johann A.: *See*—
Credner, Karl; Goring, Joachim; Brenner, Gunter; and Tauscher, Manfred, 4,092,417, Cl. 424-253.000.
Wullenwaber, Robert W. Parts-handling magazine. 4,092,055, Cl. 312-45.000.
Wunder, Friedrich: *See*—
Fernholz, Hans; Krekeler, Hans; Schmidt, Hans-Joachim; and Wunder, Friedrich, 4,092,267, Cl. 252-413.000.
Wurmb, Rolf; Beck, Fritz; and Boehlke, Klaus, to BASF Aktiengesellschaft. Secondary battery. 4,092,463, Cl. 429-105.000.
Wurmb, Rolf: *See*—
Theysohn, Rainer; Wurmb, Rolf; Seydl, Wolfgang; and Zahradnik, Franz, 4,092,284, Cl. 260-28.00R.
Wynn Oil Company: *See*—
Babish, John A.; Arnot, Larry K.; and Appel, Douglas C., 4,091,865, Cl. 165-95.000.
Wyrough and Loser, Inc.: *See*—
Leo, Thomas J.; and Reynolds, Michael J., 4,092,285, Cl. 260-28.50R.
Xerox Corporation: *See*—
Agulnek, Martin A., 4,092,632, Cl. 340-146.30F.
Andrus, Paul G.; Ullrich, Osmar A.; and Hardenbrook, James M., 4,092,165, Cl. 96-38.200.
Chang, Louis H.; Fravel, John C.; Herendeen, Carl E.; and Ruble, Frank D., 4,091,911, Cl. 400-70.000.
Fletcher, Gerald M., 4,092,021, Cl. 271-176.000.
Gibson, Harry W.; and Saeva, Franklin D., 4,092,163, Cl. 96-15.00D.
Ku, Joseph P.; Matin, Fereidoon; and Trezise, Richard D., 4,091,913, Cl. 400-124.000.
Norton, Thomas R.; and Geller, Stephen I., 4,092,714, Cl. 364-200.000.
Radler, Richard W., Jr.; Millonzi, Richard P.; and Bergfjord, John A., 4,092,161, Cl. 96-1.50R.
Saran, Amitabh, 4,092,665, Cl. 358-261.000.
Saran, Amitabh, 4,092,675, Cl. 358-261.000.
Saran, Amitabh, 4,092,676, Cl. 358-261.000.
Saran, Amitabh, 4,092,677, Cl. 358-261.000.
Yaguchi, Kunihide: *See*—
Kobayashi, Akio; Yaguchi, Kunihide; and Takaiwa, Masakazu, 4,092,402, Cl. 423-243.000.
Yamada, Makoto; and Kinaga, Eiichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Tongue plate device for use in seat belt system. 4,091,508, Cl. 24-171.000.
Yamada, Shigeyasu, to NGK Spark Plug Co. Ltd. Long distance discharge gap type spark plug. 4,092,558, Cl. 313-131.00R.
Yamaguchi, Kimiaki: *See*—
Suzuki, Ryuji; Yamaguchi, Kimiaki; Nagamoto, Shunichi; Niwa, Takashi; and Matsushima, Haruo, 4,092,512, Cl. 219-10.55F.
Yamamoto, Kazunobu: *See*—
Chiba, Satoshi; Ishihara, Kazunori; Saito, Kazuo; and Yamamoto, Kazunobu, 4,092,099, Cl. 432-59.000.
Yamamoto, Kimihiko: *See*—
Ishikawa, Hitoshi; Yamamoto, Kimihiko; Sawada, Toshio; and Kasahara, Takahiko, 4,091,755, Cl. 112-279.000.
Yamamoto, Kuniyuki: *See*—
Kurata, Noboru; and Yamamoto, Kuniyuki, 4,091,887, Cl. 180-33.00A.
Yamamoto, Yoshiharu: *See*—
Hori, Yutaka; Honda, Zenzo; Suzuki, Kenji; Nakamoto, Keiji; and Yamamoto, Yoshiharu, 4,092,452, Cl. 428-215.000.
Yamanaka, Akira; Terakado, Katsumi; and Nagaike, Naofumi, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Trucks. 4,091,888, Cl. 180-82.00R.
Yamanouchi Pharmaceutical Co., Ltd.: *See*—
Murakami, Masuo; Kawahara, Shigemi; Kawata, Hiroitsu; Okazaki, Kiyoshi; Sekino, Jun; and Shimizu, Hidemi, 4,092,428, Cl. 424-317.000.
Yamanouchi, Shousuke: *See*—
Hayami, Toshiyuki; Matsubara, Hironaga; and Yamanouchi, Shousuke, 4,092,488, Cl. 174-84.00R.
Yamashita, Junichi: *See*—
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Yamashita, Kazutaka: *See*—
Takamori, Shigeru; Yamashita, Kazutaka; and Kono, Yoshinao, 4,092,295, Cl. 260-47.0EA.
Yamashita, Tetuo: *See*—
Oishi, Toshio; Kitano, Takashi; Sasaki, Hiroshi; and Yamashita, Tetuo, 4,092,283, Cl. 260-27.0BB.
Yamashita, Yujiro. Structure for convecting paralled spaced vertical supports. 4,091,594, Cl. 52-721.000.
Yamawaki, Ichiro: *See*—
Yasumoto, Mitugi; Yamashita, Junichi; Yamawaki, Ichiro; Unemi, Norio; Kitazato, Kenji; Hashimoto, Sadao; and Fujii, Setsuro, 4,092,313, Cl. 544-313.000.
Yanagi, Masahiro, to Matsushita Electric Industrial Co., Ltd. Apparatus for detecting the breaking of a glass plate. 4,091,660, Cl. 73-658.000.
Yanagihara, Shingo: *See*—
Kozai, Teruo; Ohara, Shigeharu; Suzuki, Hiroshi; and Yanagihara, Shingo, 4,092,176, Cl. 134-186.000.
Yanagioka, Seiichi, to Aikoh Co., Ltd. Baseball bat made of fiber-reinforced plastics. 4,092,025, Cl. 273-72.00R.
Yarwood, John C.; Dore, James E.; and Preuss, Robert K., to Swiss Aluminium Limited. Filtering and inline degassing of molten metal. 4,092,153, Cl. 75-68.00R.
Yasuda, Syoichi: *See*—
Suzuki, Chuji; Yasuda, Syoichi; and Nishioka, Yoshiki, 4,092,631, Cl. 340-146.30J.
Yasumoto, Mitugi; Yamashita, Junichi; Yamawaki, Ichiro; Unemi, Norio; Kitazato, Kenji; Hashimoto, Sadao; and Fujii, Setsuro, to Taisho Pharmaceutical Company Limited. Preparation of 5-fluoropyrimidin-4-one derivatives. 4,092,313, Cl. 544-313.000.
Yatcilla, George: *See*—
White, Allen Andrew; Yatcilla, George; and Fleming, Garold Lee, 4,091,724, Cl. 100-21.000.
Yee, Werner; and Lain, Victor Y. Annunciator communication system. 4,092,599, Cl. 325-55.000.
Ying, Sui-Chun; and Cooper, Glen D., to Electric Power Research Institute. Sliding support for a superconducting generator rotor. 4,092,555, Cl. 310-52.000.
Yokomichi, Isao: *See*—
Takahashi, Ryohei; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; and Sakashita, Nobuyuki, 4,092,151, Cl. 71-94.000.
Yonezu, Hiroo: *See*—
Sakuma, Isamu; Yonezu, Hiroo; Nishida, Katsuhiko; Kamejima, Taibun; Yuasa, Tonao; Ueno, Masayasu; Uji, Toshio; Nannichi, Yasuo; and Hayashi, Izuo, 4,092,614, Cl. 331-94.50P.
Yoshida Kogyo K.K.: *See*—
Ogishi, Masaaki; and Azuma, Akira, 4,092,575, Cl. 318-282.000.
Yoshimine, Masao: *See*—
Kroposki, Lorraine M.; and Yoshimine, Masao, 4,092,312, Cl. 544-243.000.
Yoshimura, Tooru: *See*—
Hayashi, Yoshimasa; Kuroda, Hiroshi; Nakajima, Yasuo; and Yoshimura, Tooru, 4,091,615, Cl. 60-274.000.
Yoshioka, Mitsuru; Sendo, Yuji; and Murakami, Masayuki, to Shionogi & Co., Ltd. Cephalosporins having a metaloxy group in 3-substituent. 4,092,474, Cl. 544-17.000.
Yoshizumi, Hajime; Matsumoto, Nobuya; and Fukushi, Osamu, to Suntory Ltd. Preparation of alcohol or alcoholic beverages. 4,092,434, Cl. 426-13.000.
Young, Donald Leroy. Cable splicing backdrop and holder. 4,092,019, Cl. 269-296.000.
Young, Harry E., to Container Corporation of America. Flanged container. 4,091,920, Cl. 206-320.000.
Young, Richard N., to United States of America, National Aeronautics and Space Administration. Independent power generator. 4,091,613, Cl. 60-39.070.
Yourich, Adolph J.: *See*—
Burmeister, Dennis N.; and Yourich, Adolph J., 4,091,788, Cl. 123-185.0BA.

Yuasa, Tonao: *See*—
Sakuma, Isamu; Yonezu, Hiroo; Nishida, Katsuhiko; Kamejima, Taibun; Yuasa, Tonao; Ueno, Masayasu; Uji, Toshio; Nannichi, Yasuo; and Hayashi, Izuo, 4,092,614, Cl. 331-94.50P.

Yuhas, Gerald Joseph; and Turk, Leonard G., to NRM Corporation. Tire curing system. 4,092,090, Cl. 425-28.00P.

Yuki, Mikio: *See*—
Shingaki, Masamitsu; Umemoto, Tomeo; Sato, Mitsuhiro; and Yuki, Mikio, 4,091,685, Cl. 74-331.000.

Yusa, Hideo: *See*—
Kamiya, Kunio; Yusa, Hideo; and Tsuchiya, Hiroyuki, 4,092,133, Cl. 55-62.000.

Zahradnik, Franz: *See*—
Theysohn, Rainer; Wurmb, Rolf; Seydl, Wolfgang; and Zahradnik, Franz, 4,092,284, Cl. 260-28.00R.

Zajac, Chester J.: *See*—
Knecht, William A.; and Zajac, Chester J., 4,091,993, Cl. 236-46.00R.

Zaleckas, Vincent Joseph, to Western Electric Co., Inc. Method of forming substrate terminal areas for bonded leads. 4,091,529, Cl. 29-628.000.

Zap-Lok Systems International: *See*—
McCaslin, Joe C., 4,091,648, Cl. 72-121.000.

Zardi, Umberto: *See*—
Guadalupi, Mario; and Zardi, Umberto, 4,092,358, Cl. 260-555.00A.

Zavitsanos, Peter D., to General Electric Company. Metal vapor generator. 4,092,263, Cl. 252-181.400.

Zbranek, Vladimir; Zbranek, Zdenka; and Burnham, Daniel Arthur, to Engelhard Minerals & Chemicals Corp. Process for recovering high purity tungsten compositions from wolframite ores. 4,092,400, Cl. 423-54.000.

Zbranek, Zdenka: *See*—
Zbranek, Vladimir; Zbranek, Zdenka; and Burnham, Daniel Arthur, 4,092,400, Cl. 423-54.000.

Zeller, Josef: *See*—
Thalmann, Armin; and Zeller, Josef, 4,091,861, Cl. 164-437.000.

Zemke, Julius, to Technical Development Company. Filler cap assembly. 4,091,958, Cl. 220-291.000.

Zerver, Hermann J., to Hazet-Werk Hermann Zerver. Tightening wrench with angle indicator. 4,091,664, Cl. 73-139.000.

Zetter, Mark S., to Dictaphone Corporation. H_2S Direct gas sensor. 4,092,232, Cl. 204-195.00P.

Zhivov, Adolf Nikolaevich: *See*—
Genis, Semen Naumovich; Zhivov, Adolf Nikolaevich; Pereyaslavtsev, Nikolai Alexandrovich; Sukhenko, Igor Vladimirovich; Vasyagina, Nadezhda Grigorievna; and Shotsky, Viktor Ivanovich, 4,091,583, Cl. 52-81.000.

Zichis, Joseph, to Beckman Instruments, Inc. Method for the diagnosis of viral diseases. 4,092,409, Cl. 424-12.000.

Ziemba, Richard Thomas, to General Electric Company. Electrical setback generator. 4,091,733, Cl. 102-70.2GA.

Zijlstra, Anthonie Louis; and Boekkooi, Anton, to U.S. Philips Corporation. Lamps for high powers. 4,091,951, Cl. 220-2.10R.

Zimbardi, Dominic J., to Farnham, William D.; and Brooks, Teddar S., part interest to each. Air filtering system. 4,092,136, Cl. 55-212.000.

Zimmermann, Alois; and Muller, Hansruedi, to Autophon Aktiengesellschaft. Installation for two-way radio communication. 4,092,600, Cl. 325-55.000.

Zinnes, Harold: *See*—
Sircar, Jagadish C.; Kesten, Stephen J.; and Zinnes, Harold, 4,092,325, Cl. 260-307.00H.

Zinter, Donald George, to High Point Mills, Inc. Grass product and method of manufacturing the same. 4,091,568, Cl. 47-58.000.

Zodrow, Rudolf, to Jagenberg-Werke Aktiengesellschaft. Labelling machine. 4,092,206, Cl. 156-568.000.

Zodrow, Rudolf, to Jagenberg-Werke Aktiengesellschaft. Bottle labeling machine. 4,092,207, Cl. 156-568.000.

Zuccaro, Robert; and Lory, Pierre, to Plymatic. Method of making caps on a continuous production line and caps obtained thereby. 4,091,467, Cl. 2-192.000.

Zucchini, Guido, to AMA Universal S.p.A. Circuit for the recovery of solvent vapor evolved in the course of a cleaning cycle in dry-cleaning machines or plants, and for the de-pressurizing of such machines. 4,091,643, Cl. 68-18.00C.

Zverev, Anatoly Timofeevich: *See*—
Khutoretsky, Garri Mikhailovich; Zverev, Anatoly Timofeevich; Belova, Tamara Nikolaevna; Bazarov, Jury Alexeevich; and Gurevich, Elrikh Iosifovich, 4,091,528, Cl. 29-596.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 30TH DAY OF MAY, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Beecham Group Limited: *See—*
Ferres, Harry, Re. 29,650, Cl. 260-239.100.

Berry, Daniel Victor; and Knott, Stanley Gerald Thomas, to Ingersoll Locks, Limited. Locking bars. Re. 29,643, Cl. 70-52.000.

Craford, Magnus G.: *See—*
Groves, Warren O.; Herzog, Arno H.; and Craford, Magnus G., Re. 29,648, Cl. 148-175.000.

Farnsworth, Albert M. Cleaning composition. Re. 29,649, Cl. 252-171.000.

Ferres, Harry, to Beecham Group Limited. Phthalide penicillin ester intermediates. Re. 29,650, Cl. 260-239.100.

Fields, Joseph E.; and Johnson, John H., to Monsanto Company. Method of lowering blood cholesterol level. Re. 29,652, Cl. 424-78.000.

Groves, Warren O.; Herzog, Arno H.; and Craford, Magnus G., to Monsanto. Process for the preparation of electroluminescent III-V materials containing isoelectronic impurities. Re. 29,648, Cl. 148-175.000.

Herzog, Arno H.: *See—*
Groves, Warren O.; Herzog, Arno H.; and Craford, Magnus G., Re. 29,648, Cl. 148-175.000.

Hoffmann-La Roche Inc.: *See—*
Westley, John; and Stempel, Arthur, Re. 29,651, Cl. 260-345.70R.

Ingersoll Locks, Limited: *See—*
Berry, Daniel Victor; and Knott, Stanley Gerald Thomas, Re. 29,643, Cl. 70-52.000.

Johnson, John H.: *See—*
Fields, Joseph E.; and Johnson, John H., Re. 29,652, Cl. 424-78.000.

Kachik, Robert H.; Manganello, Samuel J.; and Pignocco, Arthur J., to United States Steel Corporation. Method or restoring ingot mold stools and closed-bottom ingot mold. Re. 29,646, Cl. 164-54.000.

Kaminski, Elton G., to Stolle Corporation, The. Product transfer system. Re. 29,645, Cl. 113-7.00A.

Knott, Stanley Gerald Thomas: *See—*
Berry, Daniel Victor; and Knott, Stanley Gerald Thomas, Re. 29,643, Cl. 70-52.000.

Manganello, Samuel J.: *See—*
Kachik, Robert H.; Manganello, Samuel J.; and Pignocco, Arthur J., Re. 29,646, Cl. 164-54.000.

Meader, Royal A., Jr.: *See—*
Petersen, Kenneth C.; and Meader, Royal A., Jr., Re. 29,654, Cl. 526-90.000.

Monsanto: *See—*
Groves, Warren O.; Herzog, Arno H.; and Craford, Magnus G., Re. 29,648, Cl. 148-175.000.

Monsanto Company: *See—*
Fields, Joseph E.; and Johnson, John H., Re. 29,652, Cl. 424-78.000.

Petersen, Kenneth C.; and Meader, Royal A., Jr., to Schenectady Chemicals, Inc. Preparation of hydrocarbon resins using zirconium tetrachloride. Re. 29,654, Cl. 526-90.000.

Pignocco, Arthur J.: *See—*
Kachik, Robert H.; Manganello, Samuel J.; and Pignocco, Arthur J., Re. 29,646, Cl. 164-54.000.

Pocock, Frank William: *See—*
Simpson, Arthur William; and Pocock, Frank William, Re. 29,644, Cl. 93-33.00H.

Schenectady Chemicals, Inc.: *See—*
Petersen, Kenneth C.; and Meader, Royal A., Jr., Re. 29,654, Cl. 526-90.000.

Simon-VK Limited: *See—*
Simpson, Arthur William; and Pocock, Frank William, Re. 29,644, Cl. 93-33.00H.

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McAllister, Howard G. Plant of the fern family. 4,257, 5-30-78, Cl. 88.000.

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45 4,091,634
123 4,091,635
238 4,091,636
276 4,091,637
470 4,091,638

CLASS 63

18 4,091,639

CLASS 64

4 4,091,640
21 4,091,641

CLASS 65

30 R 4,092,139
99 A 4,092,140
114 4,092,141
159 4,092,142
351 4,092,143

CLASS 66

76 4,091,642

CLASS 68

18 C 4,091,643
18 F 4,091,644
158 4,091,645

CLASS 70

52 Re.29,643
456 R 4,091,646

CLASS 71

67 4,092,144
68 4,092,145
70 4,092,146
76 4,092,147
90 4,092,148
4,092,149
92 4,092,150
94 4,092,151

CLASS 72

72 4,091,647
121 4,091,648
183 4,091,649
209 4,091,650
289 4,091,651
312 4,091,652

CLASS 73

3 4,091,653
7 4,091,654
23 4,091,655
35 4,091,656
40 4,091,657
40.5 R 4,091,658
61.4 4,091,659
88 E 4,091,661
116 4,091,662
136 R 4,091,663
139 4,091,664
147 4,091,665
170 A 4,091,666
170 R 4,091,667
263 4,091,668
299 4,091,669
302 4,091,670
313 4,091,671
343 R 4,091,672
351 4,091,673
421.5 R 4,091,674
422 R 4,091,675
425.4 R 4,091,676
425.6 4,091,677
432 R 4,091,678
497 4,091,679
517 R 4,091,680
574 4,091,681
658 4,091,660
702 4,091,682
718 4,091,683

CLASS 74

112 4,091,684
331 4,091,685
409 4,091,686
574 4,091,687
785 4,091,688
4,091,689
865 4,091,690

CLASS 75

7 4,092,152
68 R 4,092,153
109 4,092,154
124 4,092,155
203 4,092,156
206 4,092,157
254 4,092,158
257 4,092,159

CLASS 76

86 4,091,691
101 R 4,091,692
102 4,091,693

CLASS 81

9.3 4,091,694
9.51 4,091,695
57.39 4,091,890
396 4,091,696

CLASS 83

5 4,091,697
34 4,091,698
56 4,091,699
140 4,091,700
747 4,091,701

CLASS 84

1.16 4,091,702
378 4,091,703
4,091,704
385 P 4,091,705
411 R 4,091,706
423 4,091,707

CLASS 85

45 4,091,708

CLASS 89

1.703 4,091,709
1.814 4,091,710
7 4,091,711

CLASS 90

11 F 4,091,712
15 A 4,091,713
76 4,091,714

CLASS 91

1 4,091,715
49 4,091,716
498 4,091,717

CLASS 93

33 H Re.29,644
39.1 R 4,091,718

CLASS 96

1 R 4,092,160
1.5 N 4,092,162
1.5 R 4,092,161
15 D 4,092,163
27 R 4,092,164
38.2 4,092,165
4,092,166
76 C 4,092,167
84 R 4,092,168
86 R 4,092,169
91 R 4,092,170
108 4,092,171
115 P 4,092,172
119 R 4,092,173

CLASS 98

33 A 4,091,719

CLASS 99

375 4,091,720
453 4,091,721
479 4,091,722

CLASS 100

4 4,091,723
21 4,091,724
45 4,091,725

CLASS 101

38 A 4,091,726
128.2 4,091,727
288 4,091,728

CLASS 102

38 4,091,729
39 4,091,730
49.1 4,091,731
49.3 4,091,732
70.2 GA 4,091,733
70.2 R 4,091,734
79 4,091,735
92.7 4,091,736

CLASS 104

242 4,091,737

CLASS 105

164 4,091,738
224 R 4,091,739
345 4,091,740
366 D 4,091,742
366 R 4,091,741
375 4,091,743
475 4,091,744
498 4,091,745

CLASS 106

53 4,092,174

CLASS 108

153 4,091,746

CLASS 110

210 4,091,747
228 4,091,748
329 4,091,750

CLASS 111

2 4,091,751

CLASS 112

75 4,091,752
184 4,091,753
200 4,091,754
279 4,091,755
287 4,091,756

CLASS 113

7 A Re.29,645
7 R 4,091,757

CLASS 114

144 C 4,091,758
263 4,091,759
264 4,091,760
290 4,091,761

CLASS 116

70 4,091,762
114.5 4,091,763

CLASS 118

621 4,091,764
658 4,091,765

CLASS 119

106 4,091,766
157 4,091,767

CLASS 122

367 C 4,091,768

CLASS 123

1 A 4,091,769
32 EA 4,091,773
32 SP 4,091,771
4,091,772
32 ST 4,091,774
59 BM 4,091,775
90.15 4,091,776
97 B 4,091,777
117 A 4,091,778
119 E 4,091,779
119 EC 4,091,781
119 R 4,091,780
122 E 4,091,782
124 B 4,091,783
139 AT 4,091,784
140 R 4,091,785
141 4,091,786
148 E 4,091,787
185 BA 4,091,788
205 4,091,789
242 4,091,770

CLASS 124

24 R 4,091,790
73 4,091,791

CLASS 125

11 CS 4,091,792

CLASS 126

121 4,091,794
258 4,091,795
270 4,091,793
4,091,796
4,091,797
271 4,091,798
4,091,799
4,091,800
378 4,091,801

CLASS 127

30 Re.29,647

CLASS 128

2 F 4,091,802
2.05 P 4,091,803
24 R 4,091,804
41 4,091,805
92 BC 4,091,806
130 4,091,807
133 4,091,808
163 4,091,809
214 F 4,091,810
214.4 4,091,811
218 D 4,091,812
303.1 4,091,814
303.14 4,091,813
325 4,091,815
351 4,091,816
419 PG 4,091,817
4,091,818
479 4,091,819

CLASS 130

30 R 4,091,820

CLASS 131

4 A 4,091,821
9 4,091,822
17 R 4,091,823
135 4,091,824

CLASS 134

2 4,091,825
11 4,091,826
42 4,092,175
149 4,091,827
186 4,092,176

CLASS 135

66 4,091,828

CLASS 136

220 4,092,177

CLASS 137

1 4,091,829
2 4,091,830
38 4,091,831
72 4,091,832
93 4,091,833
4,091,834
118 4,091,835
259 4,091,836
341 4,091,837
528 4,091,838
533.13 4,091,839
561 R 4,091,840

CLASS 138

89 4,091,841
90 4,091,842
127 4,091,843

CLASS 139

91 4,091,844

CLASS 140

106 4,091,845

CLASS 141

1 4,091,846
7 4,091,847
94 4,091,848
302 4,091,849

CLASS 144

32 R 4,091,850
193 R 4,091,851

CLASS 148

2 4,092,178
4,092,179
12 E 4,092,180
12.7 A 4,092,181
23 4,092,182
32 4,092,183
103 4,092,184
175 Re.29,648
4,092,185

CLASS 149

10 4,092,186
11 4,092,187
19.2 4,092,189
19.4 4,092,188
35 4,092,190

CLASS 150

.5 4,091,852

CLASS 151

35 4,091,853

CLASS 152

158 4,091,854
359 4,091,855
361 R 4,091,856

CLASS 156

64 4,092,191
69 4,092,192
83 4,092,193
89 4,092,194
94 4,092,195
96 4,092,196
212 4,092,197
222 4,092,198
4,092,199
245 4,092,200
285 4,092,201
331 4,092,202
394 4,092,203
481 4,092,204
499 4,092,205
568 4,092,206
4,092,207
624 4,092,208
628 4,092,209
643 4,092,210
644 4,092,211

CLASS 160

330 4,091,857

CLASS 162

19 4,092,212
25 4,091,749

CLASS 164

54 Re.29,646
212 4,091,858
250 4,091,859
433 4,091,860
437 4,091,861
447 4,091,862

CLASS 165

1 4,091,863
4,091,864
95 4,091,865
138 4,091,866

CLASS 166

77 4,091,867
250 4,091,868
259 4,091,869
299 4,091,870

CLASS 168

4 4,091,871

CLASS 169

37 4,091,872
4,091,873
46 4,091,874
49 4,091,875
62 4,091,876

CLASS 172

9 4,091,877
147 4,091,878
373 4,091,879

CLASS 173

163 4,091,880

CLASS 174

12 R 4,092,484
28 4,092,485
48 4,092,486
52 PE 4,092,487
84 R 4,092,488

CLASS 175

7 4,091,881
286 4,091,882
287 4,091,883
410 4,091,884

CLASS 176

36 R 4,092,213
38 4,092,214
4,092,215
4,092,490
50 4,092,216
58 PB 4,092,217
84 4,092,218
4,092,498

CLASS 177

188 4,091,885
210 EM 4,091,886

CLASS 178

3 4,092,489
67 4,092,491
68 4,092,492

CLASS 179

1 F 4,092,494
1 SD 4,092,493
1 SM 4,092,495
6 R Re.29,655
4,092,496
15 AT 4,092,497
84 VF 4,092,499
90 D 4,092,500
99 4,092,501
100 R 4,092,502

CLASS 180

33 A 4,091,887
82 R 4,091,888
101 4,091,889

CLASS 181

185 4,091,891
286 4,091,892

CLASS 182

204 4,091,893

CLASS 184

103 R 4,091,894
4,091,895

CLASS 188

166 4,091,896
314 4,091,897

CLASS 192

3 M 4,091,898
3.3 4,091,899
8 R 4,091,900
61 4,091,901
076 4,091,902
107 M 4,091,904
113 B 4,091,905
129 A 4,091,906

CLASS 193

35 A 4,091,907

CLASS 194

100 A 4,091,908

CLASS 195

29 4,092,219
30 4,092,220
105 CF 4,091,903
127 4,092,221

CLASS 198

389 4,091,915
790 4,091,916

CLASS 200

5 A 4,092,503
16 D 4,092,504
38 D 4,092,505
42 R 4,092,506
51 R 4,092,507
291 4,092,508

CLASS 202

227 4,092,222

CLASS 204

23 4,092,223
32 R 4,092,224
47 4,092,225
51 4,092,226
59 R 4,092,227
68 4,092,228
180 P 4,092,230
180 R 4,092,229
181 F 4,092,231
195 P 4,092,232
4,092,233
286 4,092,234

CLASS 206

5.1 4,091,917
45.13 4,091,918
213.1 4,091,919
320 4,091,920
363 4,091,921
364 4,091,922
386 4,091,923
389 4,091,924
423 4,091,925
426 4,091,926
459 4,091,927
575 4,091,928
602 4,091,929
605 4,091,930

CLASS 208

8 4,092,235
10 4,092,236
11 R 4,092,237
80 4,092,238
213 4,092,239
301 4,092,240

CLASS 209

73 4,091,931
82 4,091,932
127 A 4,092,241

CLASS 210

23 F 4,092,242
41 4,092,243
58 4,092,244
64 4,092,245
65 4,092,246
67 4,092,247
142 4,092,338
152 4,092,248
195 S 4,092,249
500 M 4,092,250

CLASS 211

204 4,091,933

CLASS 212

8 R 4,091,934
144 4,091,935
4,091,936

CLASS 214

1 BB 4,091,937
1 F 4,091,938
16.4 A 4,091,939
17 DB 4,091,940
38 D 4,091,941
148 4,091,942
152 4,091,943
302 4,091,944
309 4,091,945
518 4,091,946
766 4,091,947

CLASS 215

222 4,091,948
251 4,091,949

CLASS 217

47 4,091,950

CLASS 219

10.49 R 4,092,510
4,092,511
10.55 F 4,092,512
4,092,513
10.75 4,092,509
99 4,092,514
121 EB 4,092,516
121 LM 4,092,515
4,092,518
137 PS 4,092,517
284 4,092,519
504 4,092,520

CLASS 220

2.1 R 4,091,951
22 4,091,952
23.86 4,091,953
203 4,091,955
231 4,091,956
260 4,091,957
291 4,091,958
304 4,091,959
4,091,960
319 4,091,961
326 4,091,962
470 4,091,954

CLASS 221

264 4,091,963
266 4,091,964

CLASS 222

192 4,091,965
211 4,091,966
238 4,091,967
282 4,091,968
309 4,091,969
596 4,091,970
603 4,091,971
627 4,091,972

CLASS 223

28 4,091,973

CLASS 224

5 V 4,091,974
4,091,975
45 R 4,091,976
47 4,091,977

CLASS 225

100 4,091,978

CLASS 226

7 4,091,979
162 4,091,980

CLASS 227

8 4,091,981

CLASS 228

173 F 4,091,982

CLASS 229

15 4,091,983
23 BT 4,091,984
35 4,091,985
62.5 4,091,986
69 4,091,987

CLASS 233

1 R 4,091,988
14 R 4,091,989

CLASS 234

115 4,091,990

CLASS 235

88 RC 4,092,521
308 4,092,522
310 4,092,523
419 4,092,524
463 4,092,525
487 4,092,526

CLASS 236

34.5 4,091,991
44 C 4,091,992
46 R 4,091,993

CLASS 237

2 B 4,091,994

CLASS 238

10 A 4,091,995

CLASS 239

177 4,091,996
206 4,091,997
283 4,091,998
289 4,091,999
532 4,092,000
533.6 4,092,001
542 4,092,002
590 4,092,003

CLASS 241

56 4,092,004
168 4,092,005

CLASS 242

47.01 4,092,006
55 4,092,007

CLASS 248

205 A 4,092,008
421 4,092,009

CLASS 250

201 4,092,529
205 4,092,530
216 4,092,531
221 4,092,532
231 SE 4,092,533
251 4,092,534
4,092,535
265 4,092,536
314 4,092,537
336 4,092,538
4,092,539
363 S 4,092,540
364 4,092,541
392 4,092,542
423 R 4,092,543
491 4,092,544
501 4,092,545
515 4,092,546

CLASS 251

4 4,092,010

CLASS 252

8.1 4,092,251
8.5 A 4,092,252
8.8 4,092,253
49.8 4,092,254
50 4,092,255
62.54 4,092,256
66 4,092,257
99 4,092,258
117 4,092,259
4,092,260
131 4,092,261
171 Re.29,649
4,092,262
181.4 4,092,263
186 4,092,264
301.1 W 4,092,265
321 4,092,266
413 4,092,267
430 4,092,268
435 4,092,269
454 4,092,270
455 R 4,092,271
545 4,092,272
548 4,092,273

CLASS 254

8 C 4,092,011
126 4,092,012

CLASS 260

2.5 AB 4,092,276
2.5 BD 4,092,275
2.5 F 4,092,277
2.5 N 4,092,274
2.5 R 4,092,278
8 4,092,279
23 H 4,092,281
23 XA 4,092,280
26 4,092,282
27 BB 4,092,283
28 R 4,092,284
28.5 R 4,092,285
29.2 TN 4,092,286
29.6 RB 4,092,287
37 PC 4,092,288
40 R 4,092,289
42.36 4,092,290
45.7 S 4,092,291
45.75 B 4,092,292
47 CP 4,092,297
47 EA 4,092,295
47 EC 4,092,293
47 EP 4,092,296
47 ET 4,092,294
75 T 4,092,298
4,092,299
78 L 4,092,301
78 R 4,092,302
78 UA 4,092,300
79.5 P 4,092,303
112.5 R 4,092,304
140 4,092,305
141 4,092,306
146 R 4,092,307
153 4,092,308
239.1 Re.29,650
4,092,309
239.55 D 4,092,310
283 SY 4,092,317
293.56 4,092,318
293.85 4,092,319
294.8 C 4,092,320
4,092,321
294.9 4,092,322
295 H 4,092,323
295.5 R 4,092,324
307 DA 4,092,327
307 F 4,092,326
307 H 4,092,325
326.5 SA 4,092,328
329 AM 4,092,329
333 4,092,330
340.5 R 4,092,331
345.7 R Re.29,651
346.75 4,092,332
347.2 4,092,333
4,092,334
348.44 4,092,335
348.45 4,092,336
408 4,092,337
410.6 4,092,339
429.7 4,092,340
429.9 4,092,341
448 A 4,092,342
453 AM 4,092,343
465 F 4,092,344
501.16 4,092,345
511 4,092,346
513 R 4,092,347
514 K 4,092,348
516 4,092,349
521 H 4,092,352
521 P 4,092,351
521 R 4,092,350
525 4,092,353
530 N 4,092,354
4,092,355
535 R 4,092,356
543 H 4,092,357
555 A 4,092,358
563 R 4,092,359
586 P 4,092,360
4,092,361
586 R 4,092,362
606.5 P 4,092,363
612 R 4,092,364
613 R 4,092,365
651 R 4,092,369
658 R 4,092,370
671 C 4,092,371
681 4,092,372
830 R 4,092,373
873 4,092,374
876 B 4,092,375
884 4,092,376

969 4,092,377
990 4,092,378

CLASS 261

25 4,092,379
69 R 4,092,380

CLASS 264

3 C 4,092,383
.5 4,092,384
15 4,092,381
25 4,092,382
45.5 4,092,385
46.5 4,092,386
46.6 4,092,387
75 4,092,388
89 4,092,389
94 4,092,390
97 4,092,391
98 4,092,392
102 4,092,393
210 R 4,092,394
221 4,092,395
249 4,092,396

CLASS 266

77 4,092,016

CLASS 267

65 B 4,092,017

CLASS 269

234 4,092,018
296 4,092,019

CLASS 270

31 4,092,020

CLASS 271

176 4,092,021
236 4,092,022

CLASS 273

26 A 4,092,023
29 BF 4,092,024
72 R 4,092,025
148 R 4,092,026
195 R 4,092,027
239 4,092,028
271 4,092,029

CLASS 274

1 R 4,092,030

CLASS 280

28.5 4,092,031
30 4,092,032
87.04 A 4,092,033
420 4,092,034
446 R 4,092,035

CLASS 285

337 4,092,036

CLASS 292

202 4,092,037

CLASS 294

78 R 4,092,038

CLASS 296

26 4,092,039
35 A 4,092,040

CLASS 297

68 4,092,041
157 4,092,042
429 4,092,043
440 4,092,049

CLASS 298

18 4,092,050
24 4,092,051
27 4,092,044

CLASS 299

2 4,092,052
17 4,092,045

CLASS 302

49 4,092,046

CLASS 303

22 R 4,092,047

CLASS 307

113 4,092,547
205 4,092,548
221 D 4,092,549
229 4,092,550
254 4,092,551
299 A 4,092,552
306 4,092,553

CLASS 308

3 R 4,092,053
8.2 4,092,054
9 4,092,048

CLASS 310

13 4,092,554
52 4,092,555
57 4,092,556

CLASS 312

45 4,092,055
219 4,092,056

CLASS 313

102 4,092,557
131 R 4,092,558
192 4,092,559
244 4,092,560
499 4,092,561

CLASS 315

189 4,092,562
200 A 4,092,563
208 4,092,564
283 4,092,565
375 4,092,566
377 4,092,567

CLASS 318

35 4,092,569
46 4,092,568
102 4,092,570
106 4,092,571
138 4,092,572
221 C 4,092,573
265 4,092,574
282 4,092,575
314 4,092,576
370 4,092,577
564 4,092,578
662 4,092,579

CLASS 320

2 4,092,580
4,092,581

CLASS 323

48 4,092,582

CLASS 324

6 4,092,583
16 R 4,092,584
16 T 4,092,585
28 R 4,092,587
28 RS 4,092,586
56 4,092,588
73 R 4,092,589
107 4,092,590
110 4,092,591
142 4,092,592
158 F 4,092,593

CLASS 325

21 4,092,594
38 A 4,092,595
49 4,092,596
53 4,092,597
55 4,092,598
4,092,599
4,092,600
322 4,092,601
346 4,092,602
473 4,092,603

CLASS 328

48 4,092,604
152 4,092,605

CLASS 329

124 4,092,606

CLASS 330

8 4,092,607
10 4,092,608
149 4,092,609
207 A 4,092,610
261 4,092,611
288 4,092,612
289 4,092,613
297 4,092,701

CLASS 331

94.5 P 4,092,614
94.5 S 4,092,615

CLASS 333

6 4,092,616
17 R 4,092,617
70 R 4,092,619
70 T 4,092,618

CLASS 335

128 4,092,620

CLASS 336

184 4,092,621
192 4,092,622

CLASS 337

66 4,092,623
340 4,092,624
405 4,092,625

CLASS 338

212 4,092,626

CLASS 339

17 F 4,092,057
218 M 4,092,058

CLASS 340

2 4,092,627
10 4,092,628
15.5 TS 4,092,629
146.1 BA 4,092,630
146.3 F 4,092,632
146.3 J 4,092,631
213 R 4,092,633
235 4,092,635
274 R 4,092,636
323 R 4,092,634
324 R 4,092,637
336 4,092,638
347 DA 4,092,639
365 R 4,092,640
409 4,092,641
413 4,092,642
416 4,092,643

CLASS 343

5 W 4,092,644
18 E 4,092,645
749 4,092,646
768 4,092,647
782 4,092,648

CLASS 346

76 R 4,092,649
155 4,092,650

CLASS 350

96.13 4,092,060
96.16 4,092,059
96.18 4,092,061

CLASS 352

170 4,092,062

CLASS 353

71 4,092,063
79 4,092,064

CLASS 354

1 4,092,651
15 4,092,702
23 D 4,092,652
60 L 4,092,653
112 4,092,654
124 4,092,655
202 4,092,656
234 4,092,657
300 4,092,658

CLASS 355

8 4,092,065
67 4,092,066
77 4,092,067

CLASS 356

73 4,092,068
88 4,092,069
106 S 4,092,070
121 4,092,071
152 4,092,072

CLASS 357

18 4,092,659
22 4,092,660
23 4,092,661
28 4,092,662
38 4,092,703
55 4,092,663
80 4,092,664

CLASS 358

10 4,092,666
26 4,092,667
80 4,092,668
107 4,092,669
125 4,092,670
128 4,092,671
149 4,092,672
183 4,092,673
186 4,092,674
261 4,092,665
4,092,675
4,092,676
4,092,677

CLASS 360

31 4,092,678
71 4,092,679
72 4,092,680
75 4,092,681
77 4,092,682
4,092,683
85 4,092,684
92 4,092,685
95 4,092,686
102 4,092,687
121 4,092,688
137 4,092,689

CLASS 361

80 4,092,690
4,092,691
94 4,092,692
103 4,092,693
126 4,092,694
232 4,092,695
283 4,092,696
386 4,092,697
399 4,092,698
415 4,092,699
428 4,092,700

CLASS 362

106 4,092,704
294 4,092,705
390 4,092,706
391 4,092,707
427 4,092,528

CLASS 363

18 4,092,709
19 4,092,710
53 4,092,711
56 4,092,708
60 4,092,712

CLASS 364

200 4,092,713
4,092,714
4,092,715
424 4,092,716
431 4,092,717
436 4,092,718
468 4,092,719
474 4,092,720
479 4,092,721
500 4,092,722
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726 4,092,723
817 4,092,724
826 4,092,725
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4,092,729
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4,092,731
4,092,732

CLASS 365

183 4,092,735
189 4,092,736
200 4,092,733
238 4,092,734

CLASS 366

3 4,092,737
81 4,092,015
156 4,092,014
165 4,092,013
304 4,092,738

CLASS 400

70 4,091,911
124 4,091,909
4,091,913
131 4,091,910
146 R 4,091,912
196.1 4,091,914

CLASS 401

209 4,092,073

CLASS 403

24 4,092,074
72 4,092,075
178 4,092,076
4,092,077
221 4,092,078
306 4,092,079
319 4,092,080

CLASS 404

10 4,092,081

CLASS 407

1 4,091,525
40 4,092,082

CLASS 408

59 4,092,083

CLASS 416

102 4,092,084

CLASS 417

44 4,092,085
50 4,092,086
131 4,092,087
360 4,092,088

CLASS 423

5 4,092,397
7 4,092,398
4,092,399
54 4,092,400
166 4,092,401
243 4,092,402
488 4,092,403
539 4,092,404
580 4,092,405
594 4,092,406
607 4,092,439
633 4,092,407

CLASS 424

1 4,092,408
12 4,092,409
60 Re.29,653
78 Re.29,652
4,092,410
114 4,092,411
212 4,092,412
241 4,092,413
248.51 4,092,414
250 4,092,415
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253 4,092,417
256 4,092,418
263 4,092,419
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309 4,092,426
317 4,092,427
4,092,428
321 4,092,429
324 4,092,430
4,092,431
326 4,092,432
331 4,092,433

CLASS 425

10 4,092,089
28 P 4,092,090
62 4,092,091
291 4,092,092
398 4,092,093

CLASS 426

13 4,092,434
296 4,092,435
478 4,092,436
573 4,092,437
601 4,092,438

CLASS 427

33 4,092,440
37 4,092,441
41 4,092,442
53 4,092,443
64 4,092,444
85 4,092,445
213 4,092,446
286 4,092,447
383 D 4,092,448

CLASS 428

29 4,092,449
40 4,092,450
102 4,092,451
215 4,092,452
255 4,092,453
288 4,092,454
295 4,092,455
307 4,092,456
341 4,092,457
402 4,092,458
403 4,092,459
407 4,092,460

CLASS 429

15 4,092,461
50 4,092,462
105 4,092,463
127 4,092,464

CLASS 431

114 4,092,095
253 4,092,096

CLASS 432

1 4,092,094
11 4,092,097
19 4,092,098
59 4,092,099
72 4,092,100

CLASS 526

1 4,092,465
13 4,092,466
80 4,092,467
90 Re.29,654
105 4,092,468
184 4,092,469
227 4,092,470

CLASS 528

502 4,092,471

CLASS 536

1 4,092,472
17 4,092,473

CLASS 564

4,092,474
21 4,092,475
26 4,092,476
4,092,477
76 4,092,478
224 4,092,311
243 4,092,312
277 4,092,314
291 4,092,315
313 4,092,313
351 4,092,316

CLASS 548

312 4,092,479

CLASS 560

37 4,092,480
77 4,092,481
213 4,092,482
255 4,092,483

CLASS 568

785 4,092,367
824 4,092,366
877 4,092,368

CLASSIFICATION OF DESIGNS

D2—	287	247,996		74	248,007		66	248,018			248,035		13	248,040		5 GH	248,050
	298	247,997		128	248,008		96	248,019			248,036	D23—	17	248,041		5 M	248,052
	320	247,998		141	248,009	D11—	81	248,020		155	248,037		73	248,042		5 R	248,051
D6—	20	248,000	D8—	14	248,010		137	248,021		182	248,038		122	248,043		15 AJ	248,054
	89	247,999		306	248,011		155	248,022	D14—	33	248,023	D24—	22	248,044	D64—	18	248,055
	97	248,001		372	248,012	D12—	5	248,029		42	248,024		32	248,045	D87—	1 R	248,056
	113	248,002		373	248,013			248,030		80	248,025		99	248,046		3 B	248,057
	161	248,003		387	248,014			248,031		91	248,026	D27—	42	248,047		3 D	248,058
D7—	13	248,004	D9—	237	248,015		66	248,032	D15—	53	248,027	D28—	13	248,048	D96—	12 C	248,059
	22	248,005	D10—	40	248,016		84	248,033	D19—	42	248,028	D30—	4	248,049			248,060
	23	248,006		50	248,017		127	248,034	D22—	1	248,039	D34—	5 GG	248,053			

CLASSIFICATION OF PLANTS

P.—	7	4,254		54	4,255			4,256		88	4,257			

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 4,091,710	4,091,798	4,092,336	4,091,894	4,092,586	4,092,542
4,092,189	4,091,800	4,092,374	4,091,895	4,092,591	4,092,584
4,092,197	4,091,807	4,092,376	4,091,946	13 : 4,091,503	4,092,605
2 : 4,091,876	4,091,810	4,092,379	4,091,965	4,091,512	4,092,696
4 : Re.29,649	4,091,813	4,092,383	4,092,052	4,091,765	18 : 4,091,513
4,091,716	4,091,817	4,092,390	4,092,128	4,091,844	4,091,614
4,091,945	4,091,831	4,092,396	4,092,400	4,091,860	4,091,964
4,092,024	4,091,841	4,092,399	4,092,506	4,091,937	4,091,982
4,092,249	4,091,849	4,092,404	4,092,633	4,091,983	4,092,144
4,092,522	4,091,865	4,092,438	4,092,641	17 : 4,091,481	4,092,233
4,092,540	4,091,868	4,092,466	4,092,695	4,091,483	4,092,291
4,092,580	4,091,870	4,092,508	9 : 4,091,555	4,091,516	4,092,326
4,092,715	4,091,883	4,092,509	4,091,596	4,091,519	4,092,344
4,092,726	4,091,910	4,092,530	4,091,624	4,091,548	4,092,351
5 : 4,092,038	4,091,911	4,092,531	4,091,659	4,091,632	4,092,386
4,092,710	4,091,913	4,092,532	4,091,663	4,091,645	4,092,436
6 : 4,091,464	4,091,917	4,092,534	4,091,701	4,091,649	4,092,511
4,091,465	4,091,918	4,092,539	4,091,980	4,091,695	4,092,547
4,091,476	4,091,919	4,092,549	4,091,993	4,091,704	4,092,594
4,091,484	4,091,925	4,092,550	4,091,999	4,091,706	4,092,692
4,091,491	4,091,927	4,092,567	4,092,033	4,091,762	19 : 4,091,523
4,091,493	4,091,931	4,092,589	4,092,048	4,091,785	4,091,661
4,091,495	4,091,950	4,092,599	4,092,082	4,091,788	4,092,578
4,091,510	4,091,975	4,092,603	4,092,102	4,091,804	4,092,644
4,091,518	4,091,976	4,092,608	4,092,153	4,091,811	20 : 4,091,473
4,091,533	4,091,978	4,092,611	4,092,154	4,091,816	4,091,572
4,091,536	4,091,979	4,092,616	4,092,244	4,091,825	4,091,674
4,091,554	4,091,988	4,092,617	4,092,248	4,091,837	4,091,724
4,091,556	4,092,019	4,092,619	4,092,315	4,091,839	4,091,738
4,091,564	4,092,027	4,092,620	4,092,343	4,091,852	4,091,767
4,091,576	4,092,035	4,092,621	4,092,349	4,091,897	4,092,042
4,091,582	4,092,039	4,092,627	4,092,467	4,091,906	4,092,420
4,091,587	4,092,041	4,092,639	4,092,515	4,091,920	4,092,429
4,091,595	4,092,045	4,092,645	4,092,634	4,091,922	21 : 4,091,546
4,091,618	4,092,055	4,092,648	4,092,679	4,091,926	4,091,601
4,091,621	4,092,057	4,092,661	4,092,680	4,091,947	4,091,644
4,091,623	4,092,092	4,092,664	4,092,685	4,091,949	4,091,795
4,091,631	4,092,166	4,092,665	10 : 4,092,058	4,091,957	4,091,824
4,091,652	4,092,177	4,092,673	4,092,194	4,091,968	4,091,933
4,091,654	4,092,181	4,092,675	4,092,230	4,091,992	4,092,031
4,091,665	4,092,188	4,092,676	11 : 4,091,736	4,091,995	4,092,034
4,091,667	4,092,190	4,092,677	4,092,502	4,091,998	4,092,077
4,091,680	4,092,193	4,092,682	12 : 4,091,478	4,092,009	22 : 4,091,543
4,091,698	4,092,195	4,092,683	4,091,584	4,092,040	4,091,629
4,091,705	4,092,232	4,092,686	4,091,666	4,092,074	4,091,986
4,091,711	4,092,236	4,092,701	4,091,676	4,092,204	4,092,029
4,091,731	4,092,237	4,092,704	4,091,879	4,092,241	4,092,106
4,091,732	4,092,245	4,092,714	4,091,880	4,092,258	4,092,242
4,091,734	4,092,252	4,092,724	4,091,989	4,092,304	4,092,319
4,091,760	4,092,256	4,092,725	4,092,000	4,092,378	4,092,625
4,091,766	4,092,274	4,092,732	4,092,302	4,092,409	24 : Re.29,647
4,091,776	4,092,296	4,092,733	4,092,435	4,092,412	4,091,489
4,091,794	4,092,312	8 : 4,091,474	4,092,576	4,092,433	4,092,109

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

4,092,159
4,092,198
4,092,199
4,092,441
4,092,444
4,092,520
4,092,635
4,092,729
25 : 4,091,541
4,091,622
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42 : Re.29,646
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44 : 4,092,073
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45 : 4,091,835
46 : 4,092,145
47 : 4,091,504
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53 : 4,091,479
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4,091,558
4,091,671
4,091,719
4,091,743
4,091,746
4,091,942
4,091,990
4,091,996
4,092,498
54 : 4,091,628
4,092,403
4,092,486
55 : 4,091,488
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4,091,713
4,091,873
4,091,877
4,091,905
4,091,914
4,091,944
4,091,972
4,092,004
4,092,147

DESIGN PATENTS

4 : 248,006
248,058
6 : 248,001
248,010
248,012
248,013
248,032
248,033
248,038

248,039
248,049
248,050
248,051
248,057
8 : 248,009
9 : 248,055
12 : 248,002
13 : 248,004

248,042
17 : 248,003
248,008
248,017
248,019
248,025
18 : 248,005
248,007
248,054

25 : 248,014
26 : 248,040
27 : 248,044
248,045
248,052
31 : 248,026
248,056
33 : 247,998
34 : 247,996

247,997
248,047
36 : 248,000
248,020
248,023
248,024
248,048
38 : 248,037
42 : 248,011

248,015
47 : 248,034
248,035
248,036
48 : 248,021
248,053
248,059
248,060
56 : 248,028

PLANT PATENTS

6 : 4,254

12 : 4,257

22 : 4,255

4,256

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